

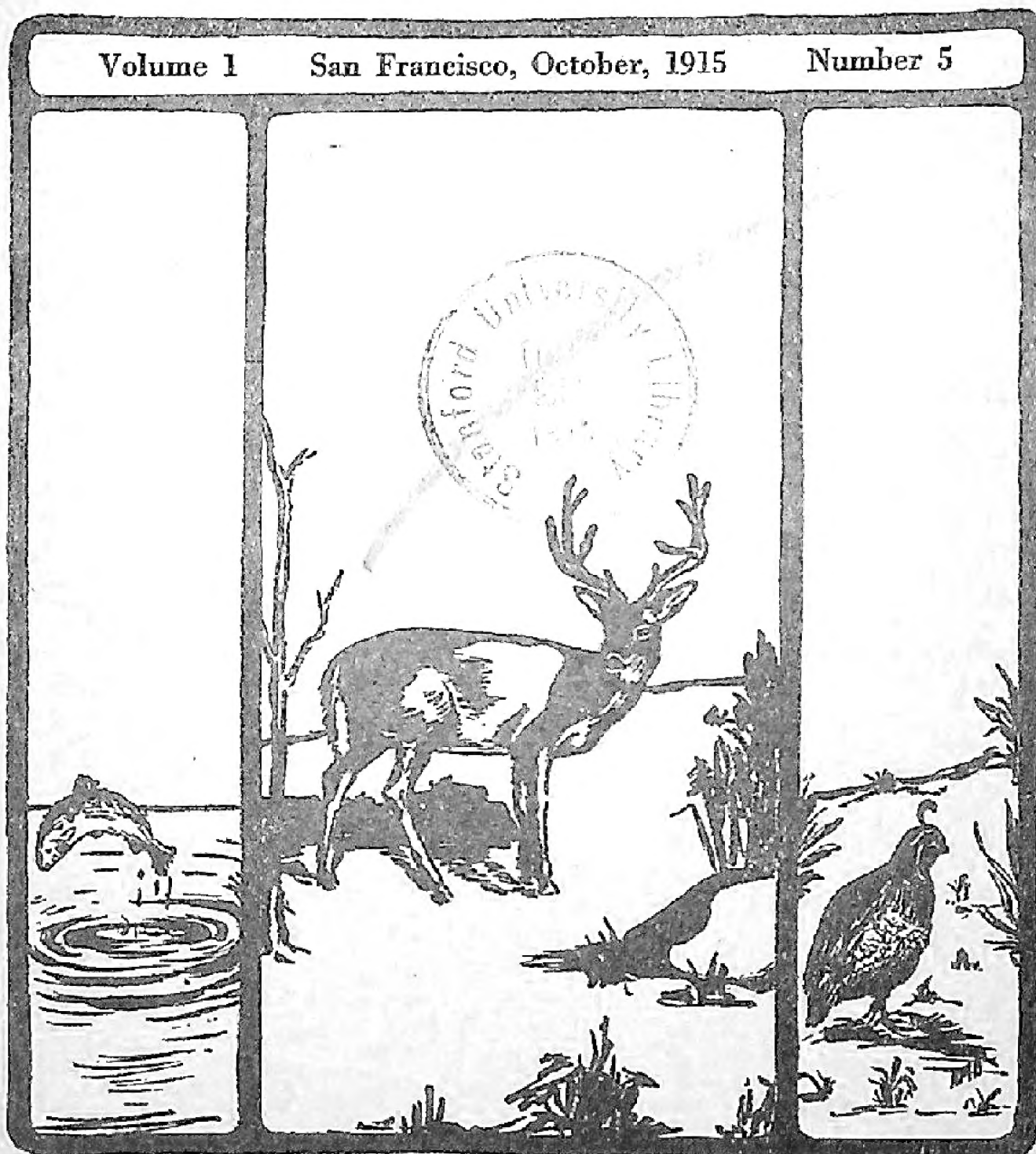
CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 1

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Number 5



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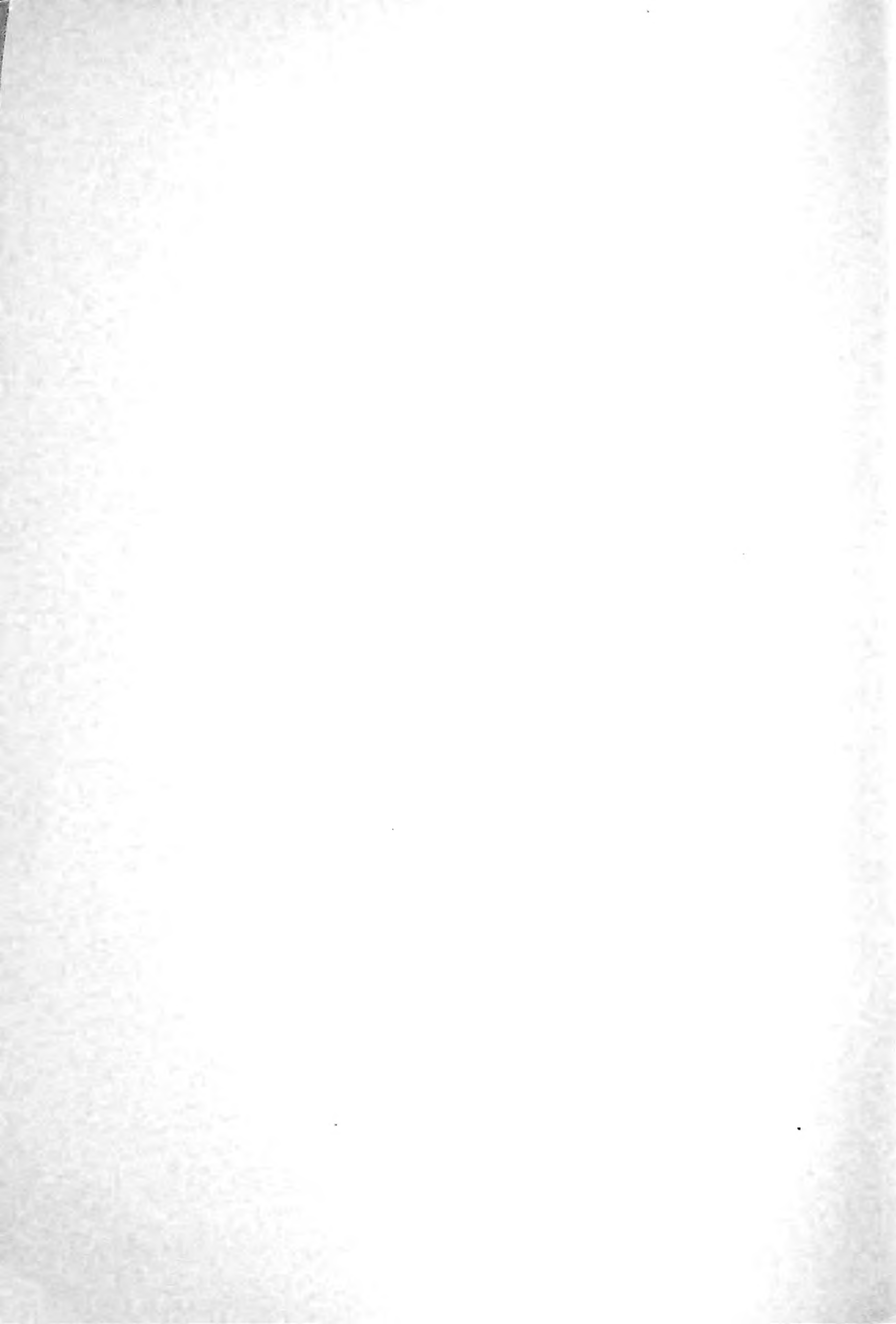
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CONTENTS.

	Page.
THE ADMINISTRATION OF FISH AND GAME LAWS____ <i>Ernest Schaeffle</i>	209
SOME HINTS ON MAKING PHOTOGRAPHS FOR ILLUSTRATION_____	
<i>Tracy I. Storer</i>	212
THE MEANING OF NATURE STUDY_____	<i>Carroll DeW. Scott</i> 216
SOME PRECAUTIONS IN THE PLANTING OF TROUT____ <i>John P. Fisher</i>	220
EDITORIAL _____	222
HATCHERY AND FISHERY NOTES_____	230
CONSERVATION IN OTHER STATES_____	233
LIFE HISTORY NOTES _____	236
WILD LIFE IN RELATION TO AGRICULTURE_____	241
REPORTS—	
VIOLATIONS OF THE FISH AND GAME LAWS_____	243
SEIZURES AND SEARCHES_____	244
NUMBER OF DEER KILLED DURING THE OPEN SEASONS 1911-1914_____	245
FINANCIAL REPORT _____	247
INDEX TO VOLUME I_____	249



CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

THE ADMINISTRATION OF FISH AND GAME LAWS.*

By ERNEST SCHAEFFLE,
Executive Officer, California Fish and Game Commission.

The speaker deeply appreciates the honor of having this subject assigned to him for presentation—a subject which has engaged his attention for a considerable number of years and one that he considers of much importance. The fish and game of the country have a value that is now unquestioned and, quite naturally, the various means used in the preservation of the supply are of increasing interest. It is indeed significant and encouraging that this distinguished association should give its time for a discussion of the proposition.

At the outset the speaker desires to suggest that the administration of law, while of admitted importance, may in time prove to be of less value to a commonwealth than the voluntary observance of wise regulations on the part of the public, a consummation that would render unnecessary large police forces and complicated and expensive programs. That it is not impossible to bring about such a condition seems to have been demonstrated already in this State, where twenty years ago even the leading citizens, and sometimes the public officials, violated the fish and game laws openly and without fear of punishment. Today the game law violator is usually the irrepressible mountaineer or the unschooled immigrant, while to the offense is attached the same obloquy that attends the commission of larcenies and other unpopular misdemeanors.

For reasons easily appreciated the so-called "game laws" have not always been held in the same esteem as those laws which are designed primarily for the protection of the person and private property. Game laws in the past—and even today in other countries—have had as their real purpose not so much the protection of wild life as they have had the protection of the more or less imaginary rights of the landholder against trespass. Human selfishness, aided by the almost universal respect for property for itself, has quite naturally dictated the enactment of drastic statutes and their rigorous enforcement, with the result that the propertyless majority in all lands have come to have a hatred and disregard for even those laws whose purpose is good.

Handicapped by this antagonistic sentiment the administrator of fish and game laws has had, in the past, a task almost impossible of accomplishment. In this country the task has been peculiarly difficult, for added to the unfavorable public sentiment has been the weakness of a democratic form of government in compelling law observance. This weakness has been demonstrated nowhere so fully as in the field of wild life protection and has resulted in what the speaker has long considered an unnecessary and extravagant political arrangement.

*A paper read before the American Association for the Advancement of Science at its annual meeting held at the University of California, Berkeley, California, August 2, 1915.

In practically every state this proven incapacity of the regular peace officers has forced the citizens to organize special forces of "game wardens" whose duties in the past have consisted largely of the detection and prosecution of those offenders against the statutes with whom the sheriffs, constables, and other statutory officials either could not or would not interfere. This scheme of providing an extra piece of machinery for performing the functions of a regular branch of government seems peculiarly American and should be a source of condemnation rather than of satisfaction. Not only is the scheme expensive, but also demoralizing in its certain tendency toward a shirking of responsibility and the inevitable public acquiescence in a bad condition.

But given the game warden—what then? As we have seen, there has existed—in the past at least—a widespread suspicion and dislike of the game statutes, which in itself has created a difficult and discouraging task for the officer. Added to this state of the public mind there has been an inexcusable condition of statute which has irritated and disgusted the practical-minded American and doubly handicapped the warden. The trouble has not been that laws were lacking, but rather that there has been a multiplication of faulty and ambiguous statutes, the work of officials and legislators lacking in knowledge of the conditions calling for remedy.

As is well known, the average fish and game official of the past was a gatherer of political scraps. If he knew anything at all it was something absolutely foreign to fish and game conservation—a subject that interested him solely because of its possibilities in the way of paying off political debts and of building up a private machine. Small wonder it is that the fish and game supply of the country has diminished to the danger level; if nature were not so wonderfully prolific there would be nothing left. It must ever be borne in mind that while fish and game are held to be public property in the United States, yet there is no private preserve system and no such thing as the private breeding and protection of game on an extensive scale. Game is plentiful in older countries—yes; but in those countries the general public lacks the opportunity for practically unrestricted shooting, and game is bred in immense quantity. For game shooting, which does not include the shooting of rabbits, hares and at least some kinds of wild fowl, Great Britain issues about 68,000 licenses yearly. For the same period, California, with an area practically the same as Great Britain, but with less than one-fifteenth the population, issues 160,000 licenses. It can be seen that there is no warrant for the claim often made that California could have on sale the same quantity of game as Great Britain and that the British system is better for both game and man.

It will be freely granted that the restriction of the shooting privilege to the aristocratic minority makes for a positive limitation in the kill of game, and consequently is of advantage in that one direction. But is the saving of the fishes, birds, and mammals from ultimate extinction all that even the conservationist is concerned with? How about the "rights" of the common people to outdoor life, recreation, fishing—and even killing, if they desire to kill? In this country we feel that it is not only right, but wise, that man's instinct for sport be kept alive. Would not certain European nations be better off in this crisis if their common people—boys and men—had been permitted to hunt, fish,

learn to camp out—and to handle arms? We think so; and further, we think that a state or country where the average man knows how to shoot is safer in times of peace and war than those countries which are obliged to depend upon conscript armies of men whose experience with firearms is limited practically to the dismounting, assembling and polishing of their weapons.

But to get back to our theme, the inadequacy of legislation. With experience from past blunders to guide them, progressive fish and game officials have been working for sane legislation—legislation based upon actual, demonstrable facts in connection with the life histories of their charges; until now the fish and game laws of most states begin to meet the purposes for which they are intended. With the enactment of proper laws—laws that even the layman, who is no fool, sees to be reasonable and likely to bring about beneficial results—has come a gratifying reversal of public opinion. Where once game laws were made only to be broken we now find them being religiously observed by the average person. What this new condition augurs for the future of conservation can not be estimated; but the outlook would seem to be bright.

Added to the bungling laws of earlier days so aptly described by a leading jurist of the State as "legislative blacksmithing," and the usual incapacity of administrative chiefs, went a corresponding incapacity in subordinates. These men were almost without exception given their reward for political services, served unwillingly their allotted time, and were displaced at the election time by a batch of the same, or worse material. But in the last twenty years has come a decided change for the better, not only in fish and game administration, but in government generally. With a realization of the fact that earlier and existing wasteful practices meant the extinction of all wild life forms within a generation, came a demand for positive conservation through the adoption of proper legislation, for the selection of earnest and fit officials, for the strict enforcement of statutes, and for the development of an informed and healthy public sentiment.

How this has been done and is now being done can not be set forth in a paper limited as this of necessity must be. The speaker feels justified in declaring, however, that conditions as a whole are very satisfactory in most of the states. In this State, for instance, we have a fish and game department under the strictest civil service control. Deputies are chosen in rigid, but practical, examinations, and are protected from political whim and spite by the regulations of an able and impartial civil service board. Having the assurance of continuous employment during good behavior and the faithful performance of duty, the individual warden now has pride in his position and strives to train himself for better service and promotion. What was once a seasonal "pick-up" has become a well-paid, respectable profession, offering inducements to educated, solid men whose connection with the public service is a real asset to the State.

Men of this character not only can wield elubs when occasion demands, but they can go about among the people, instructing them as to the vital necessity of conservation at this day and winning them over as converts and allies for positive, constructive activities. Already we are getting results from the work of such men, and because people as a rule desire to do the right thing, when they know what the right

thing is, we feel justified in expecting such "team work" in time that the fish and game supply will be safe. And this to the mind of the writer is the greatest work an educator or police official can do—to do his own work so well that finally there is no need for him at all.

SOME HINTS ON MAKING PHOTOGRAPHS FOR ILLUSTRATION.

By TRACY I. STORER,

Assistant Curator of Birds, California Museum of Vertebrate Zoology.

Photographs intended to illustrate articles relating to fish and game and similar subjects should be "snappy," that is with good contrast between the lightest and darkest parts, and sharply focused so as to show all details distinctly. Such pictures differ in several respects from those prepared for artistic purposes. No special kind of camera or lens is necessary for the production of good illustrative material but of course some kinds are more convenient and capable of being used for a wider range of subjects than others. More really depends upon the worker's familiarity with the instrument used than its style or equipment. Pictures possessing the qualifications mentioned are obtained by paying attention to certain details of manipulation. The possibilities in animal photography are enormous. Whole books have been written about the subject, and it is by no means yet exhausted. This article is intended merely to indicate some of the principal points to be observed in securing such pictures and to stimulate interest in the work.

There are many different styles and makes of cameras, but all can be grouped into a few simple classes. First there are the box or fixed focus cameras such as the "Bullseye" and "Brownie," to secure sharp pictures with which the distance from camera to subject must be considerable, usually twenty feet or more. Roll-film and filmpack cameras such as the Folding Pocket Kodaks and Filmpack Premos, in which the front bearing the lens can be drawn out and set for varying distances, can be used for a wide range of subjects. For objects less than fifty feet from the lens the distance should be carefully measured and the front bearing the lens set at the corresponding distance-mark on the scale. When provided with an extra "portrait" lens (which slips on over the front of the regular lens) these cameras will produce sharp photographs of objects within three feet of the lens; otherwise the minimum distance is about six feet. Cameras using plates (or film packs in adapters) and provided at the back with a ground glass form the third class. With these it is possible to see the image on the ground glass exactly as it will appear in the finished picture (except for color), and to arrange and focus it by altering the distance of the lens until a position is reached in which the image is quite sharp. Reflecting cameras such as the "Graflex" and "Reflex" form a fourth class. In these the subject may be viewed, arranged and focused on a ground glass up to the instant of exposure. Because of their high cost and special manipulation they will not be considered here.

If time exposures are to be made, some kind of a camera support is necessary. In emergencies the camera may be set on a box, chair, ladder, or other similar support, but when much work of this kind is to be done a tripod is essential. It should be a substantial affair. Folding wooden tripods are capable of being used under a wider variety of conditions and are more dependable than the slightly more compact telescoping metal ones. When photographing such things as footprints (and some nests) a tilting tripod top is a great convenience; one of the broad, hinged-board type is most satisfactory.

Probably the most difficult problem with which the amateur photographer has to contend is that of determining the proper exposure (the time which the shutter must be open for light passing through the lens to act sufficiently on the plate or film). Exposure depends upon light strength, nature of subject, lens "stop" and speed of plate used. As most amateurs use but one brand of plates or film almost exclusively, the last item need not be considered.

Light is photographically strongest during the middle of the day, during June and July, on sunny days, and at high altitudes. It is weakest in early morning and late evening, in December and January, on dull cloudy days, and near sea-level. Under conditions between the extremes mentioned the light is of intermediate strength.

Instruments known as actinometers ("light measurers") can be obtained from dealers in photographic supplies. These devices enable the light intensity to be accurately measured and by simple calculations the necessary exposure can be determined. Altogether they furnish the best solution to this vexing problem. The Wynne and Watkins actinometers are well known and widely used. Then there are numerous tables, charts, and calculators, but these all involve human judgment in estimating the light intensity. Finally one may learn to judge light intensity fairly well through experience, but this is a tedious and expensive process and often results in failing through incorrect exposure to secure what otherwise would have been valuable pictures. One of the best ways of becoming familiar with different light conditions is to make a set of experimental exposures of the same subject under different light conditions (as at different times of the day and under different conditions of the weather) and of different subjects under similar light conditions (at about the same time on a single day). Then study the results obtained and use them as guides in future work.

Dark subjects or ones with deep (faintly lighted) shadows, or subjects close to the camera require relatively longer exposures while views including sea, clouds or sky need less, as indicated in the table here given.

Sea and sky.....	1/10	} Times normal exposure.
Snow scenes	$\frac{1}{4}$	
Subjects with light foreground.....	$\frac{1}{2}$	
Objects less than 20 feet from camera.....	1 $\frac{1}{2}$	
Dark objects	2 to 8	

Camera lenses vary considerably in their construction, but are all made on the same general principle and serve the purpose of bringing light rays from the subject to a sharp focus on the sensitive plate or film. All modern cameras are provided with some means of reducing the diameter of the aperture in the lens. This has the important

effect of increasing the distance within which objects included in the field of view are in sharp focus. Box cameras usually have these "stops" on a metal strip, by moving which one or another of the different sized apertures (usually 3) may be placed in front of the lens. Other cameras have an "iris diaphragm" (so-called from its resemblance to the structure of the same name in the human eye) with which the size of the aperture may be varied at will. Certain designated apertures, called "stops," are marked on the lens barrel or on the shutter case. Two systems, the "F" and the "U. S." (uniform system), are in vogue. The stops marked on most cameras together with the proportionate exposures necessary are as follows:

Stop in F system-----	8	11	16	22	32	45	64
Equivalent stop in U. S.							
system -----	4	8	16	32	64	128	256
Proportionate exposure ---	1	2	4	8	16	32	64

Objects close to the camera require the use of a smaller stop (that is, one of a higher numerical value) and a correspondingly longer exposure. As a general rule for subjects within twenty feet of the camera use stop f/16 (= U. S./16), and for objects under six feet use stop f/22 (= U. S./32) or even a smaller one.

In the case of living subjects where a short exposure is necessary to prevent movement in the picture a large stop will usually have to be employed, with the result that only a part of the picture will be in sharp focus. Under such conditions it is better to be content with taking the picture at a greater distance and securing a smaller but sharper image, which can later be enlarged.

Subjects involving a considerable range of color, such as landscapes including snow, clouds or sky, are more satisfactorily rendered by being photographed through a ray filter or color screen. Use of a ray filter increases the necessary exposure from three to eight times, the exact amount being indicated on the filter or instructions accompanying it.

Development is best carried out by the tank method, as this gives better average negatives, especially if the exposure has not been exactly right. Prints for illustration should be made on glossy paper and should be "glaced," that is, squeegeed on a polished ferrotype plate so as to have a very glossy surface. They should not be mounted. The data pertaining to them is preferably written on a separate piece of paper which is pasted along the lower edge; if written on the reverse side of the print care should be taken to bear lightly so as not to injure the highly finished surface. The data should include descriptive title, date and photographer's name.

Prints smaller than $2\frac{1}{4} \times 3\frac{1}{4}$ inches are rarely of much value for illustration. It is well to have them the same size or twice the size that they are to appear when published.

It is by no means impossible to secure good photographs of living animals with an ordinary camera; in fact, some of our best pictures of wild birds and mammals have been secured with very inexpensive apparatus. One scheme that has been used with success is to focus the camera on a point marked by some inconspicuous object, and then wait

for or induce the animal or animals to occupy or pass the spot, whereupon the shutter is snapped. In photographing a bird on the nest the camera can be placed in the proper position on its support and left some time—for several hours or even days—until the bird is no longer afraid of it. A thread, or a strong rubber bulb and long tube, fastened to the shutter release will permit the operator to conceal himself at some distance and make the exposure at a favorable instant. For concealment and protection the camera may be covered with a piece of light-tight, waterproof material.

Many kinds of big game have been successfully photographed (some even by flashlight) by arranging a thread across a path or runway frequented by the animals. One end of the thread is attached to a firm support such as a tree, and the other end to the shutter release, the camera being placed at one side of the runway, focused on the latter, and securely anchored against movement. When an animal in walking along the path presses against and breaks the thread, the shutter is snapped and the picture obtained.

Birds and even some mammals may often be attracted by regularly placing food or water or both in a well lighted spot. Some excellent pictures have been obtained by attracting the animals to a favorable location in this manner.

Many good pictures have been secured by the use of "blinds" in which the photographer can remain concealed until the animals being studied approach near enough to be photographed. A blind can be easily constructed of a large umbrella with an elongated staff by which it is supported from the ground, and with a piece of cloth hung from the side to form a rounded enclosure for the camera man. The whole tent should be of an inconspicuous green or brown color. Loop holes in the side cloth permit the lens being protruded to secure pictures. Such a blind is easily transported. In many situations it may be covered with grasses or brush for further concealment. Sometimes a blind of natural materials such as brush and grasses can be constructed on the spot. Finally there are many little tricks to be learned in photographing animals in the open. A flock of feeding birds may often be directly approached if the photographer is careful to move slowly. Often by creeping along the ground with his camera in front of him, ready to snap at any instant, he may be successful.

THE MEANING OF NATURE STUDY.

By CARROLL DEW, SCOTT.

Supervisor Nature Study and Agriculture, San Diego Public Schools.

Man can not get away from his past and be normal. The forces of heredity chain him in many ways to the experience and thought of his ancestors. How strong those forces are is shown in the persistence among men of the most primitive beliefs and superstitions—the belief for instance that the moon has an effect on germinating seeds or that it is unlucky to have anything to do with the number thirteen. If man's ideas are colored by the far-off past, how much more his physical body, habits, senses. The young child is still a little savage, born with only a greater aptitude for culture perhaps than his savage ancestors. Man still lives for the greater part of his time in touch with the primitive things of the world. His health is continually menaced by changes in temperature of the air, by the attacks of insects and bacteria; his individual energy, his racial achievements are more or less according to the climate and the abundance or scarcity of natural resources. If man is successful in conquering nature it is just as true that he is in danger of being conquered by his own civilization, which is not only based upon nature but violates her laws to man's vital injury. We are still children of nature. We can not do without a knowledge of her laws and we remain in ignorance of her at our peril. It is still necessary for the sake of man's body, mind and soul to take cognizance of his natural surroundings.

Because man's life has its roots so deeply imbedded in the recent past the child instinctively turns to the natural phenomena about him. From the time children are a few years old they are attracted by flowers, insects, trees. Their first passion is perhaps the love for a dog or cat. They like to play in the water and they have a fondness for dirt and sand both inside and out. It is a striking proof of the stupidity of men that they have not from the beginning used the materials at hand in the child's world to educate him. In spite of the common fact that in every generation thousands of self-educated persons have become trained to efficiency in life by the natural method of doing well whatever their hands found to do, educators have taken children away from the things of most interest to them and tried to train them by a so-called logical method of instruction based upon the needs of the adult mind. And they are still doing it everywhere. The first step in the education of a child is to secure his attention. To do that you must put something before him that takes hold of his interest. Mental faculties develop by use. It makes no difference whether the mind is impelled to exert itself by force or curiosity so long as there is native attraction. Children are naturally interested in plants, growing things, living things that compose the outdoor world. There is no better way to train their minds than to direct their attention to these things.

How much shall we include in the nature study course? That will always be a question of judgment for the teacher, largely decided by the locality. Usually the difficulty is to choose the best material from a bewildering mass. The teacher can not go far astray if she keep in mind the viewpoint in nature study—a concrete study of the child's

natural environment. Nature study is not geography, or biology, or physics, or anthropology; but it may take facts freely from these or other sciences. As much geography or history, for example, might be taken as the child can gain a first-hand knowledge of. In San Diego the beach and ocean make ideal nature study; in Nebraska the study of the ocean would be physical geography. Gardening easily belongs in nature study because it is closely related with everything else out of doors—more so for instance than carpentry or watch-making. Any further discussion of this topic must come under methods.

In the primary grades the attainment of knowledge is only a minor end (in education). The child does not remember what he learns, and it is too general to serve him if he did remember it. He is learning to handle tools of knowledge, and the greatest of these is the mastery of his language. Nature study makes the best contribution towards this end of any branch of study. Because the subject-matter of nature study is of interest to the child, because it is all about him, and because it is real, concrete, visible, it is the best means of developing power of oral and written expression. To talk and write about the plants in his garden, the birds in his trees, the pets in his backyard, the butterflies, rocks, animals he has seen in the parks or in the country is one of the delights of childhood. The life story of most men of power shows that the idea that stale and uninteresting things must be done to train the child's mind is a foolish delusion.

If there is any principle of modern education that will stand the test of time it surely is that one which declares that children learn most easily and many learn almost entirely, by self-activity. Because adults from their wide experience are able to learn from books or lectures does not prove this to be the best method with children or even with adults. Even with adults the lasting impressions are those made by our own senses. Even good literature is rarely written outside a writer's own limited experience. Bret Harte's stories of California, a country in which he spent his early manhood, are masterpieces; but those of other places in which his experience was meager or second-hand are pale and unconvincing. If concreteness is essential to clear-cut ideas for adults, how much more necessary for children, whose minds are not stored with varied images which supplement their eyes and ears.

In his mental and physical development the child follows the large course of his ancestry. It was only a short time ago both historically and geologically that our forefathers were educating their brains by using implements of stone and wood and iron, by using their senses to apprehend danger, to discriminate between plants and animals that were useful or harmful to them. And scientists tell us that civilization has been won from the jungle by this training of the hand and eye and ear and emotions, because it has increased the size of the brain and laid the foundation for the acquisition of all our present knowledge. Just so the child's brain responds to the stimulus of impressions from the senses and especially to the physical effort made in walking, playing, working, collecting and gardening. The study of nature will cultivate habits of observation and discrimination which will sharpen the wits in any line of work the child may take up. And the effort to see things

accurately will give him a love for truth—one of the highest benefits education can bestow.

Nature study is the indispensable preparation for agriculture and science either in the higher grammar grades or the high school. When the essentials of plant and animal life and gardening operations are learned at the proper time the work of advanced courses can proceed properly. As it is now, students enter these courses usually without the information which they should have learned in their early teens. And what is more lamentable, those who quit the grammar grades before graduation grow up ignorant of how to plant, cultivate or irrigate a garden, ignorant of the plants best adapted to their home town, and of the value of protecting wild birds and animals. Many children interested in nature study will become florists, landscape gardeners, teachers of science, and farmers. Indeed the main reason for introducing agriculture into the schools is that the prosperity of the state depends largely upon the number of its well-trained farmers. But if the average child should learn enough to become an intelligent citizen, to make an attractive home with flowers, trees and vegetables around it, the purpose of nature study in the grades would be fulfilled.

There is no better service that nature study can render the child than to make him love the outdoors. All children when they are young want to be outdoors where they belong, but, as they begin to go to school, they get the indoors habit. All their lessons and many of their games are indoors. There is too little play outdoors and most of that is artificial and often involves the wideawake child only. Nature study alone can furnish an interesting reason for going outdoors, away from the nerve-racking noises and sights of cities; and this habit once cultivated will remain always an antidote to the too close application to business or social pursuits. Grown people will not go into the country without some stimulus or purpose, and to most of them nowadays the country is stupid and repelling. That is because they know nothing interesting about it. To the naturalist every landscape is full of interest and wonder.

It is mostly idle to talk to children or grown-ups about cultivating a love for the beautiful in nature, because on the part of the child it is an evolution of spirit, and if it is not present in the adult you can not talk it into him. All nature is beautiful to a nature-lover, because it is all the result of the working of law and order and a part of the wonderful universe. The child goes to nature from instinct, curiosity, wonder, and for bodily exhilaration. He is attracted first by living, moving things—often even by the desire to kill them like his savage ancestors did. (Most grown people today can not pass a snake or a lizard without trying to kill it.) Gradually he comes to love all these things, to see their relations and exquisite adaptation to the world, and to appreciate the beauty of inanimate things such as clouds, landscapes, sunsets. Stevenson said the average person would not spend three minutes looking at a landscape. But the nature-lover and the artist spend hours and days and never tire. The love of nature is a growth of spirit. It elevates life and gives a sense of companionship with the world which keeps us from being extremists. It makes for sanity. But it must be consciously cultivated because pavements and houses and trolley cars tend to kill it.

It is gratifying to see that more and more people each year go into the primitive places which have now become more accessible by the extension of railroads and the invention of automobiles. Yet only a small percentage of people can afford to travel very far and most of them go for the excitement of moving from place to place rather than for any interest in the treasures of the landscape. Future generations will think more of the country and less of the means of transportation, for they will go to the wild places for weeks at a time instead of for a day or a few hours.

The average man of the city is the one who most needs the country to keep him out of the grooves of work and worry. He needs parks and playgrounds in the city and in the suburbs, and it is for his sake largely that we want thousands of acres not only of improved but of primitive landscape. We want to teach nature to children so that, as future citizens, they will appreciate the necessity of maintaining recreation centers, of preserving wild places, of protecting birds and harmless animals so that future generations may study and enjoy the plants and animals which nature has evolved through millions of years but which man may ruthlessly exterminate in a decade. We must realize that "there is nothing so practical as the preservation of wild beauty." The present generation is the guardian of this wild beauty for those to come. The time and place to emphasize this truth is in the public schools, so that conservation of resources will become a national habit and duty.

Such, then, are some of the sidelights that illumine the meaning of nature study in the grammar grades. The educational value of concrete, living, moving things and processes as materials of study, is becoming recognized. Also it must become evident to teachers that it is just as important (perhaps more so) to help a child to be happy as to be effective. Nature study should add to individual happiness by putting one on more intimate terms with the living things about him which are all wonderfully made and patterned and colored like the skies of sunset. We must live and be happy and healthy where we are, and association with nature is one of the strongest influences towards making us what we ought to be. We must go back to nature for vigor, vision, and peace.

SOME PRECAUTIONS IN THE PLANTING OF TROUT.

By JOHN P. FISHER.

At this time of the year the State hatcheries send out many millions of trout fry to stock the streams of the State. Comparatively few people are familiar with the necessary precautions which are vital to the successful stocking of our streams, and many fish are lost because of the inexperience of those engaged in planting. Hence, a word of advice to prospective fish planters may be in season.



Fig. 47. Planting trout on the American River. Photo by McCurry Company.

Two things must be carefully watched—the temperature and the aeration of the water. A lowering of the temperature or lack of air quickly affects trout fry.

The necessary equipment must include a thermometer and a dipper. The ordinary thermometer to be purchased at any notion store is as good for this purpose as a higher priced one, and an ordinary handled tin dipper having a cover of wire screen soldered over the top of the bowl is all that is required.

When the fish are received the temperature of the water should be taken. This will be found to be about 40° Fahrenheit. It should be borne in mind that the temperature should at no time be allowed to rise higher than 45° Fahrenheit. If the fish must be transported any great distance during warm weather, it will be best to provide ice as a means of keeping down the temperature of the water in the fish cans.

The ice should be well wrapped in an old blanket or other non-conductor. Care should be taken when placing the ice in the cans that the fish are not injured.

During the journey from the hatchery to the stream there is great danger that the fish will be smothered because of insufficient aeration. This should be carefully guarded against. If the fish are transported by wagon, the jolting of the wagon over rough roads will under ordinary circumstances provide aeration enough to the water; but if transportation is by auto or by wagon over smooth roads, the water in the cans should be aerated every fifteen or twenty minutes. This can be done by taking a dipperful of water from the can, raising the dipper about twenty-four inches above the can, and then pouring the water back into the can. This operation should be repeated six or eight times.

By keeping careful watch of the temperature and looking to the aeration of the water no trouble will be had. Only in exceptional cases is it necessary to change the water. If it is found necessary to keep the fish over night before they can be planted, one of two methods may be adopted to keep the fry in condition. If there is a flume carrying cold water handy, the cover may be removed from each can of fish, a piece of mosquito bar or bobbinet may be tied securely over the opening, and a small stream of water dropped into each can from the flume. If there is a running stream available, the cans should be uncovered, adjusted as above, and then laid on their sides in the water. The tops should be up stream at a slight angle to the current so as to secure circulation. In either case it is best to equalize the temperature by first taking a few dipperfuls from the can and replacing by water from the flume or stream, continuing to do this until both are of the same temperature.

Upon arriving at the stream or lake where the fish are to be planted, the first precaution taken must be to equalize the temperature in the manner above noted. A point should then be selected on the stream or lake where the water is shallow and where the bottom is sandy or gravelly. Here some of the fish may be slowly liberated. The same process may then be repeated at other suitable points.

THE SNOWY PLOVER.

By CARROLL DEW. SCOTT.

Little snowy plover pacing on the strand,
Blending like a sea-shell with the gray-white sand,
On your back the sand-bar, on your breast the foam,
Over land or water you are quite at home.

Do you wish to lure me far and far away
Till the siren breakers charm my soul astray?
Ah, I know your fluttering wing and anxious pace
Only lead me farther from your nesting place.

Somewhere on the sand-dunes (I would never tell)
In a hollow lined with bits of kelp and shell
Three gray eggs would answer for your pretty game
Or three downy nestlings colored just the same.

Charming home you've chosen on the shining dunes;
On one side the wavelets lap their peaceful tunes,
On the other sound the thunders of the surf—
'Twixt the bay and ocean, neither sea nor earth.

CALIFORNIA FISH AND GAME

A publication devoted to the conservation of wild life and published quarterly by the California State Fish and Game Commission.

Sent free to citizens of the State of California. Offered in exchange for ornithological, mammalogical and similar periodicals.

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All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, Cal.

October 15, 1915.

"Unquestionably, nothing can be of more value to the cause of game protection at this time than a systematic campaign of education conducted officially by the game departments in every state in the Union, and an extension in the work on that line now being performed by the federal bureau."—Henry Chase.

BEAVERS TO BE TRANSPLANTED TO YOSEMITE VALLEY.

Permission has been obtained from the Superintendent of the Yosemite National Park to introduce into the lower part of Yosemite Valley a number of golden beavers (*Castor subauratus*). The Fish and Game Commission will attempt to transplant several of these animals from the Cache Slough district of Solano County to the Yosemite. In the National Park they will doubtless receive careful protection, and as conditions are ideal the animals should increase rapidly and thus rehabilitate a place long since depopulated by the trapper. Should this experiment prove successful, other transplantations will doubtless be made. Oregon has already obtained marked success in starting new colonies in different parts of that state. Reduced to very small

numbers here in California five years ago, the beaver is now on the increase, and if the proper protection is given, the animal will doubtless re-establish itself in all favorable localities in the State.

OVER 12,000 DEER KILLED IN CALIFORNIA LAST YEAR.

For several years past the California Fish and Game Commission has attempted to obtain a census of the number of deer killed in the different counties of the State during the open season. The Commission is indebted to forest rangers and deputies for the detailed information which has been cheerfully furnished the last four years. These reporting have been unable, of course, to record every deer killed, and often reports for the different counties need to be multiplied two or three times to show the actual number killed. However, these reports furnish a basis on which a reliable estimate of the total annual kill of deer can be made.

On page 245 will be found a table showing the number of deer killed in each county as computed from the data received from deputies and forest rangers. The tabulation shows an increase for each year. This does not necessarily mean that there has been an actual increase in the number of deer killed, for those reporting have been able to make more complete reports each succeeding year. Nevertheless, the increased number of hunting licenses issued and the ease with which the hunter reaches the hunting districts would seem to insure a greater kill each year.

It is interesting to compare the numbers killed in the different counties. A glance will show where deer are abundant and where they have been reduced to small numbers. Trinity County leads the list with a total of 735, nearly 100 more than were killed in any other county. Monterey is second with a total of 632, and Siskiyou third with 575. In southern California, where in many places deer have been nearly extirpated, a correspondingly low kill was reported. The returns show a total of only 143 for Los Angeles County, 102 for Riverside, 97 for San Bernardino, and but 45 for San Diego.

The total number reported for the open season of 1914 is 8,699, a number exceeding the kill for 1913 by 430. Only 6,489 were reported for the year 1911. When the fact is considered that only a portion of the deer killed in each county is reported, it seems safe to say that the actual kill for 1914 must exceed 12,000.

Could deer be sold on the market, each would bring an average price of \$25. Hence the yearly crop of deer in California is worth approximately \$300,000. This represents a capital of at least \$4,000,000. From an economic standpoint, therefore, the deer of this State are certainly worth conserving. They form a natural resource representing in money value millions of dollars and producing an annual crop valued at \$300,000.

A much more accurate count could be made if all hunters were required to report their kills, as is required in many eastern states. The need for information as to the yearly kill of deer is obvious. Legislation should be based on absolute evidence as to the crop that can be safely harvested without imperiling the breeding stock necessary for the persistence of the species. Accurate reports would also furnish evidence valuable in preventing concentration of hunting in certain localities. The number of deer killed in each county should be in proportion to the deer population.

Twelve thousand deer a year is obviously too great a toll considering the size of our breeding stock. It is fortunate that at the last legislature a successful attempt was made to shorten the season and to protect spiked bucks. Should a greater or equal number of deer be reported for the open season of 1915, definite steps will necessarily have to be taken to prevent further endangering of the breeding stock. It will be far better to control the yearly kill so as not to imperil the breeding stock than to be forced to close the season to allow recuperation.

SAME FISHING LAWS APPLY IN NATIONAL PARKS.

There has been some misunderstanding regarding the laws relating to fishing in the national parks. A communication from Assistant Secretary Sweeney of the

Department of the Interior states that the laws of the State of California obtain and are enforceable in the Yosemite, Sequoia and General Grant National parks. Hence persons desiring to fish in the waters in these parks must first secure a fishing license and be governed by the State laws as well as by those obtaining within the national parks.

THE ARMY OF HUNTERS.

The present European war has stirred up a great deal of sentiment favoring preparedness. In the discussions as to means of providing a trained army are to be found many references to the potential power available in the army of hunters. We here quote a few paragraphs from an article by Mr. Charles Askins on "Federal Game Protection," which appeared in the August number of *Recreation*. We recommend these statements to the thoughtful consideration of our readers:

"Modern wars are not going to brew long enough before the pot boils over to permit us to train men with no knowledge of firearms into soldiers in time to be of any use. We must have men who are already potential soldiers, who have every attribute of the soldier except military tactics and military discipline. We can trust the intelligence of Americans to quickly learn military commands, but it takes far more time to teach men the accurate use of a gun, and to inure them to outdoor life. A man's ability to hike long distances without breaking down, and his ability to live comfortably and maintain his health in camp are of no less importance than his skill in the use of a gun * * *.

"Congress made an appropriation of fifty thousand dollars for the three million sportsmen and game shooters of America, her backbone of outdoorsmen. That is a cent and a half apiece, and is perhaps the true measure of what Congress considers sport worth from a sentimental standpoint. Now if we can convince our lawmakers that shooting men are worth more than that from a utilitarian point of view, possibly the next game law will have some brains put into it and some authority placed back of it. If we can't convince Congress that the sportsmen of America are worth more than a cent and a half apiece, as an

asset of national defense, then the deal is off for good * * *.

"If the game of the United States is ever to be protected and conserved by the Government for the purposes of sport and not for its own sake, as our sentimentalists desire, it will only be because an alternative is presented—that of a civilian army of half a dozen million outdoorsmen, or a standing army of a million men."

conform the regulations to the wishes of the majority of sportsmen so far as it can be done and at the same time give wild fowl the necessary protection."

Fortunately the game laws of California have been made to conform to the federal laws, so there can be no misunderstanding in this State. If one follows closely the state laws he need not fear that the federal laws are being broken.



Fig. 48. Klink's Lake, Sisson, California, now used as a rearing pond for salmon. Five million salmon are being held at Sisson for distribution late this fall.

MIGRATORY BIRD LAW.

The United States Biological Survey, which is in charge of the enforcement of the Federal Migratory Bird Law, has issued a warning that the federal regulations for the protection of wild life must be observed in spite of the agitation regarding the constitutionality of the law. The federal regulations as amended October 1, 1914, will be strictly enforced.

"The department will consider any recommendations submitted in good faith for amendment of the regulations, but will hold no public hearings thereon, nor will it amend the regulations prior to October 15, 1915. It is the purpose to

GOOD PHOTOGRAPHS.

The Fish and Game Commission is building up a collection of photographs depicting the work of the Commission and the present status of fish and game. The attention of deputies is therefore called to the instructions for making good photographs contained in Mr. Storer's article on page 212. It is very desirable that the photographs procured for the Commission's collection be of such a quality as will render them available for scientific illustration. Experience is the best teacher of photography, but much may be learned by a careful perusal of the directions given in the article mentioned.

MORTALITY AMONG WATERFOWL AROUND GREAT SALT LAKE, UTAH.

A disease which attacks waterfowl similar to that which appears at Tulare Lake has been reported for a number of years from Great Salt Lake, Utah. Thousands of wild ducks, snipe, sandpipers, and other birds have perished from some unknown cause. The United States Biological Survey has investigated conditions there, and Mr. Alex Wetmore, Assistant Biologist, has recently published

[Tulare Lake, Owens Lake] and one strongly recommended is to station men on the marshes to gather up the helpless birds and pen them on fresh water. Considering the great number of birds that might be saved in this way the expense will be slight, and in dry seasons this may prove the only feasible means of relief." Mr. Wetmore states that California sportsmen will be interested to know that at present this appears to be the only measure that will prove successful on Tulare Lake.



FIG. 49. White pelicans on island in Clear Lake, California. A view from Salisbury's Wild Life Films which show these birds on their breeding grounds.

a preliminary report (U. S. Dept. Agric. Bull. No. 21, May 26, 1915) as to the results of the investigations.

No evidence was obtained that sulphur or smelter and factory waste were responsible for the disease. On the other hand, all evidence seems to show that mortality results from an alkaline poison the exact nature of which is still to be determined.

"Fresh water is the only remedial agency yet discovered for dealing with this mortality among waterfowl * * * A measure which might be adopted in all three localities [Great Salt Lake,

THE PROPAGATION OF GAME BIRDS.

Following the institution of a new department called the Department of Applied Ornithology by the National Association of Audubon Societies has come the publication of a series of bulletins written by Herbert K. Job giving definite information as to ways and means of propagating game birds. There are now available three bulletins as follows:

No. 1. Attracting birds about the home. Illustrated, 32 pp. Price 15 cents.

No. 2. Propagation of upland game-birds. Illustrated, 36 pp. Price 35 cents.

No. 3. Propagation of wild water-fowl. Illustrated, 32 pp. Price 25 cents.

The sales are virtually at cost and exclusively for the benefit of the Association.

Mr. Herbert K. Job, formerly State Ornithologist of Connecticut, has had long experience in the propagation of game birds. He has also traveled widely and obtained information as to methods used at all of the best game farms in the United States. Hence his bulletins are authoritative and will be of great help to all those interested in the propagation of game.

eastern states. Fish and game associations and sportsmen unite in proclaiming these pictures as among the finest wild life pictures ever taken. Not only do these films portray animal life in its native habitat and so create active interest but they teach wild life conservation (see Figs. 49 and 50).

THE MACOMBER PHEASANTRY.

By far the most extensive attempt by private enterprise to rear the ring-necked pheasant in captivity is that by Mr. King Macomber of Paicines, San Benito County. Mr. Macomber owns



Fig. 50. Young bald eagle in nest. A view from Salisbury's Wild Life Pictures.

SALISBURY'S WILD LIFE PICTURES.

All who have seen the Salisbury Wild Life Pictures will be interested to know that there are now thirty-five sets of these films being shown in the United States. After selling the state rights to the pictures in California, Mr. Salisbury took them East and showed them in all of the best theaters. In Chicago they were run for several weeks at the famous Studebaker Theater. State rights to the films have now been sold in most of the

about fifteen thousand acres in San Benito County, much of which is especially well adapted for the ring-necked pheasant. He is greatly interested in firmly establishing this valuable game bird on his ranch. His object is not so much to have these birds furnish sport as to have them furnish interest and life to his home surroundings. Thirteen hundred ring-necked pheasant chicks were out of the shell, seventeen hundred eggs were in incubators, and seven hundred

eggs under hens on June 14, 1915. Two men are in charge of the work and it is their intention to be able to furnish several thousand birds for liberation this fall.

Last year about nine hundred birds were liberated and they are to be seen commonly about the ranch house and in the lowlands nearby. A number evidently bred in the wild, as females with their young have been seen during the summer. About one hundred and fifty breeding hens are kept to furnish the eggs for hatching. Six hens are given each cock.

In addition fifty pair of Hungarian partridges were recently obtained from Hungary. These have been placed in an enclosure covering an acre of ground affording natural cover and water. These partridges are apparently doing well, and certainly this experiment will demonstrate conclusively whether it is possible to breed these birds in California. Every precaution has been taken to protect the birds natural surroundings and the pens are made proof against attacks by voracious mammals by the use of half-inch wire netting.

There is probably no area in California where pheasants are doing so well as on the Macomber ranch. With the addition of several thousand pheasants this fall the ranch will be alive with these beautiful birds.

Mr. Macomber has also increased the quail near his home place by protection and by feeding. Each morning hundreds of quail gather in front of his home to feed. Several mothers with their young have been seen recently.

The sanctuary idea is also to be furthered by the construction of a deer park comprised of four or five hundred acres. This park will be surrounded by a strong wire fence and will contain excellent cover and running streams. The park will be stocked with deer and possibly with elk.

A PROTEST AGAINST THE INTRODUCTION OF WYOMING ELK IN SAN LUIS OBISPO COUNTY.

Have you ever tried to make a high mountain tree grow in our hot valleys? If so, it is almost certain your attempt

has proved a failure. It has become a matter of such common knowledge that the plant life peculiar to a hot tropical climate will not thrive in a cold country that no one tries to raise dates in Alameda County or pineapples in Trinity County. Each plant becomes so accustomed to certain conditions of temperature and moisture that it seldom thrives in unlike conditions. The same laws hold with animal life. Every effort to introduce the Gambel or desert quail into northern California has met with failure.

With this evidence at hand it appears that the present move to introduce elk from Wyoming into San Luis Obispo County is ill advised.

The Wyoming elk (*Cervis canadensis canadensis*) is an animal accustomed to a cold climate. For several months during the winter, deep snow covers the ground so that even the valleys to which the elk migrate furnish but little forage. Transport these elk into San Luis Obispo County and you place them in an entirely different environment—in fact, one so different that it is very doubtful whether they would survive. In addition you endanger the farmers' crops, for an altitudinal migration is certain to take place between summer and winter.

We have in our own State a fine herd of native elk. These animals are the remnant of the vast herds that roamed over the great valleys in the early days. They do well in a warm climate and would without doubt soon stock a range if transported to other parts of the State. Already an attempt to start herds in other parts of California has been made by the California Academy of Science. Last fall fifty head were captured near Buttonwillow, Kern County, and shipped to various parts of the State. Why should not the people of San Luis Obispo County and all others interested in the introduction of elk into California make the proper arrangements with the California Academy of Science and procure some native valley elk? Such a move would help in preserving our native game and would assure success, whereas the attempt to introduce the Wyoming elk would doubtless prove but a costly and unsuccessful experiment.

TO GAME BREEDERS IN CALIFORNIA.

Believing that it is to the interest of game conservation to foster the breeding of game birds and mammals in captivity, CALIFORNIA FISH AND GAME stands ready to publish short notes regarding the success of breeders in this State. Should the amount of material warrant it, a special department will be formed wherein those interested can obtain an avenue of publication. If you desire information as to methods of rearing game birds in captivity or wish to give publicity to success which you have obtained, write the editor of CALIFORNIA FISH AND GAME.

snow goose, white-fronted goose, fulvous tree-duck, and mud-hen.

Two methods were used this past spring and summer to stock the pond. Eggs were collected in the Alvarado marshes and hatched at the Game Farm, and downy young and floggers were captured in the same locality and near Mendota in Fresno County.

Another year experiments will be carried on to determine the feasibility of breeding wild ducks and geese in captivity. This past year a number of mallards were reared and a setting of eggs was obtained from a cinnamon teal which had been kept in captivity for more than a year.

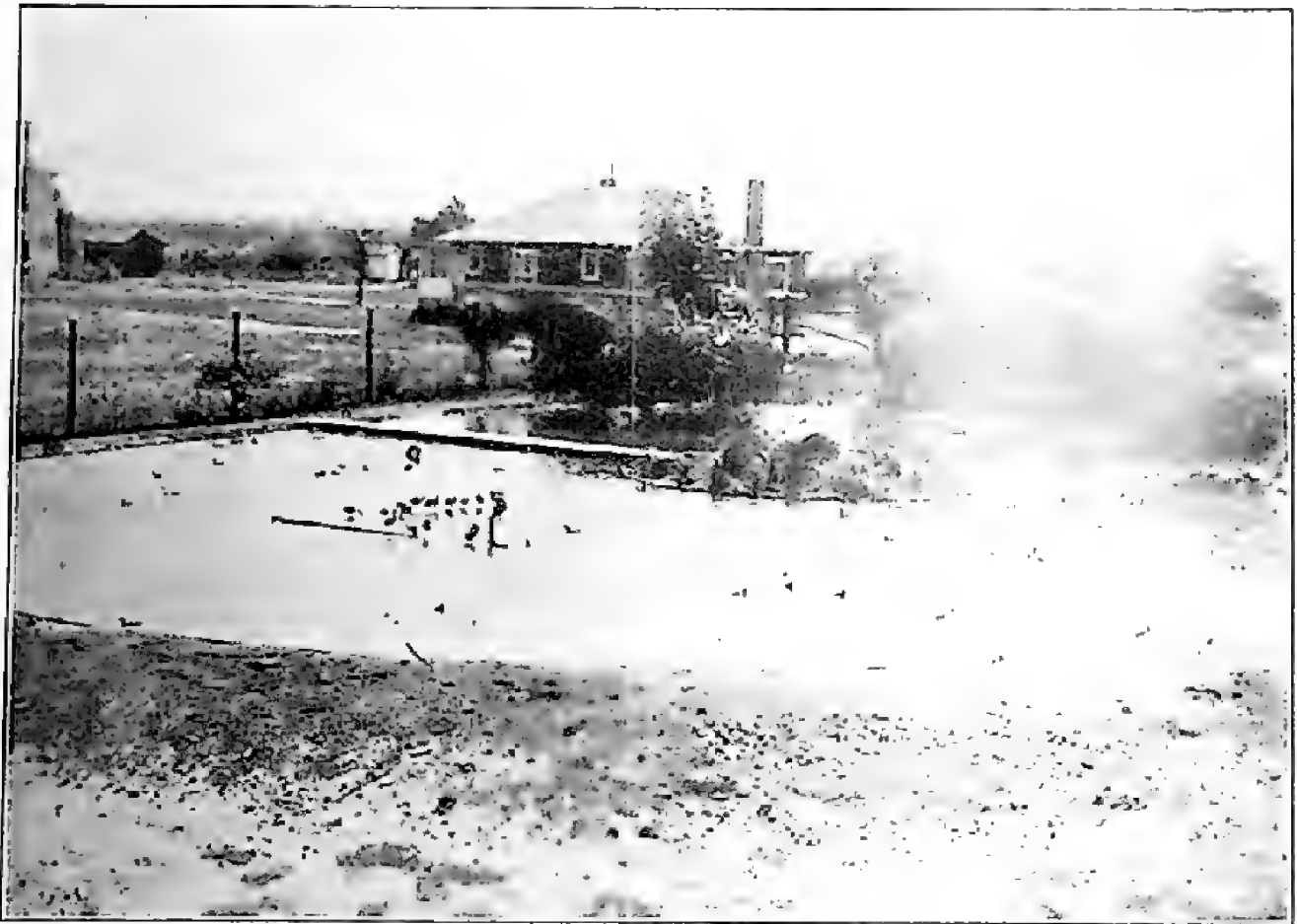


Fig. 51. The new duck pond at the State Game Farm. Sixteen different species of wild-fowl are to be found on the pond at the present time.

NOTES FROM THE GAME FARM.

A fine new pond has been constructed for wild fowl at the State Game Farm at Hayward, and this now affords a home for more than two hundred and fifty ducks and geese. The following species are represented: mallard, gadwall, baldpate, green-winged teal, cinnamon teal, Bikal teal, shoveller, pin-tail, mandarin, red-head, lesser scaup, ruddy, lesser

Only a few hundred ring-necked pheasants were reared this year. These are being planted in large lots in localities where pheasants have already made a start. This should aid the birds to increase in those localities where it has been demonstrated that favorable conditions exist.

Success has attended the efforts to rear California valley quail. Over three

hundred birds hatched in incubators and reared in brooders are now nearing maturity. A few small plants will be made. The experiments have clearly demonstrated that the valley quail is not a difficult bird to rear in captivity.

NATIVE BIRDS FURNISHED FOOD.

The Oakland park department has decided to take up one of the methods so widely advocated for increasing the numbers of native birds. All new shrubbery designed for the parks of Oakland has been selected with the idea in mind of providing a supply of food for birds. A number of the best fruit-bearing plants have been purchased, and the nurseries will soon be ready to furnish the correct type of food plants. By this method the Oakland parks will be made attractive to native birds.

blowing, part the feathers midway between the legs. Insert a knife blade under the skin and cut a slit from the vent to the breast bone. Gently push the skin back from the legs and tail, disjuncting legs at knee and tail vertebrae at first joint. The flesh should be removed from the bone still attached to the foot. The skinning of a large bird is facilitated by tying a stout cord to the bare legs and hanging the bird up. In this position it becomes easy to work the skin over the body, thereby turning it inside out. The wings are disjuncted at the first joint and the skin pulled over the neck and skull. The head of a duck or woodpecker is so large that the skin at the back of the head has to be slit in order to successfully pull the skin over the head. Cut carefully around the ear and eye sockets and continue pulling

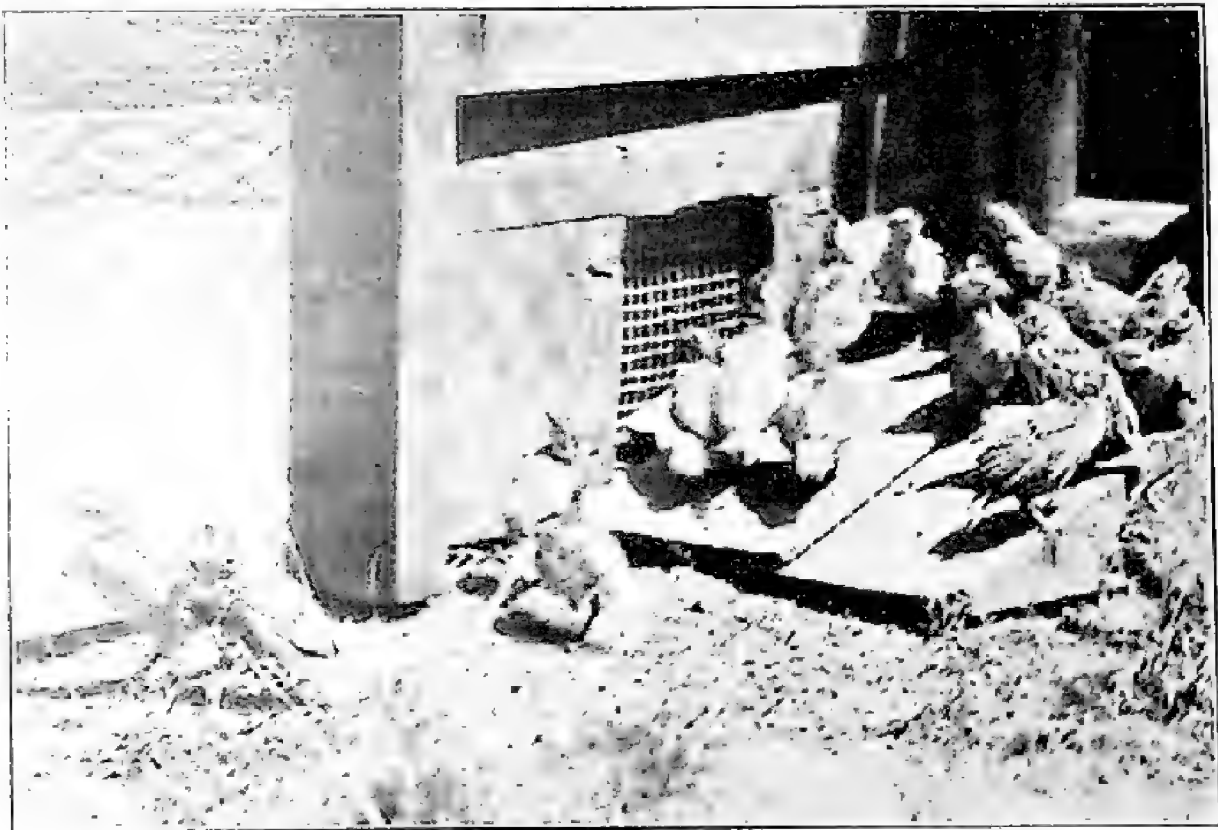


Fig. 52. Young valley quail raised at State Game Farm. Over three hundred quail were hatched from incubators this year.

HOW TO SKIN A BIRD FOR MOUNTING.

It is often necessary to know how to skin a bird in order that it be saved for mounting or for accurate identification. By closely adhering to the following directions a useful scientific specimen may be made.

Lay the bird on its back on a flat surface (a board or table) and by gently

the skin down to the beak; then cut out a piece as follows: one cut upward between the jaws, well forward, severing the tongue, two cuts parallel with the jaw bones on each side of the neck and one cut across the back of the skull over the neck; these cuts can be made with a thin bladed knife or a small scissors. A gentle pull will then remove the brain, tongue and meaty parts of the head.

The eyes should be removed and the skull and skin rubbed with common salt or commercial arsenic.

By pushing the skull back through the neck the skin may be turned right side out, dried, and packed. In making a "study skin" cotton is used for stuffing. — JOHN P. FISHER.

CALIFORNIA DEPUTY TAKES NEW POSITION.

Mr. J. S. Hunter, for many years past a deputy of the California Fish and

Game Commission and in more recent years Assistant Secretary, has accepted a position with the United States Biological Survey. Mr. Hunter will collect evidence on alleged violations of the Lacey Act and of the Federal Migratory Bird Law. Since leaving the employ of the Commission, Mr. Hunter has traveled extensively through the Pacific Coast states, and is now located in Washington, D. C., where he will spend the winter working up briefs for important cases of violations of federal game laws.

HATCHERY AND FISHERY NOTES.

FISH AND THE MOSQUITO PROBLEM.

In the war which in the near future will be waged against the mosquito in all parts of this State, fish will play an important part. It may be one of the activities of the State Fish and Game Commission to supply fish for mosquito extermination just as they now supply fish for food and sport. Most small fish and the young of the larger fish eat the mosquito larvæ or "wigglers," but the small, viviparous top minnows of the southern states have the reputation of being the best for the purpose. Top minnows have been taken to Honolulu where they have become established and have greatly reduced the number of mosquitoes. These fish bring forth their young alive and have several broods a year. They mature very quickly, those at Honolulu bringing forth a brood at the age of three months. Thus there may be several generations a year.

We have here in California a fish which, in the San Francisco Bay region at least, is just as good as the top minnows would likely be, and possibly a great deal better. It has been known that our little stickleback eats mosquito larvæ, but it has not been known until recently that in the bay region this fish is a perfect control of the salt marsh and fresh water mosquito in waters that are inhabited by it.

I first learned of the sticklebacks' good work from Mr. W. L. Chandler, who in his mosquito extermination work at Black Point near San Rafael and on the Suisun Bay marsh at Bay Point has thoroughly demonstrated that sticklebacks keep the water inhabited by them

free from mosquito larvæ. I recently spent a day on the marshes at Bay Point and went with Mr. Chandler over the district on which he is working. He has found by experience and observation that it is not necessary to spray oil on water that can be reached by these fish, and all such places have not been oiled this year. Ten days before our visit all places not inhabited by sticklebacks had been oiled, but since that time mosquitoes had come in from surrounding districts and deposited their egg rafts on the water. Most of these had hatched and the wigglers were in evidence in places where the fish could not reach them, as in cow tracks and in isolated pools; but in no instance did we find even a few of the wigglers where there were sticklebacks. Sticklebacks were there in large numbers and, on the tide which was then high, they had penetrated to the remotest reaches of the water in the marsh. The only barrier to them was dry ground or a perfect mat of fine grass and algae. By knowing that the stickleback can be relied upon, no time and money is now being wasted in oiling anything but the pools that cannot be reached by the fish. That the extermination of the mosquito wigglers was due to the sticklebacks is certain, for sticklebacks were there in large numbers and there were no other fish to be found. Water insects and larvæ of insects may eat the wigglers; but these insects were found in the isolated pools where the wigglers were present as well as in the places where there were fish and no wigglers.

During the extreme high tides, the sticklebacks gain access to tide pools

that are ordinarily isolated. The receding tides leave them prisoners in these pools, where during the summer months they are lost when the water evaporates or becomes too stagnant. The loss of sticklebacks in this manner is enormous and must keep their number greatly reduced. In the work in mosquito control on the salt marshes, small ditches could be dug to connect the isolated pools with the main body of water, so that the fish could get at pools that are ordinarily inaccessible and could get away again when the tide recedes. Thus the number of fish would be increased and they would kill off the mosquitoes in many places that now have to be oiled every two weeks.

The most remarkable thing about the mosquito control work at Bay Point is its complete success and its ridiculously small cost. The work was taken up two years ago because the mosquitoes had become unbearable. The large lumber mill in the district had been obliged to close down occasionally on account of this pest, and when it was running the efficiency of the men was much reduced on account of the necessity of continually fighting mosquitoes. Herds of cattle which took refuge in the water to escape the mosquitoes' stings were drowned by the rising tide. Now the town and mill are practically free of mosquitoes and everyone testifies to the great success of the war that has been waged against this pest. The cost of the work for the first year was \$700, but for this second year the cost will be but little more than \$200. The cost was necessarily much greater for the first year because the territory had to be learned and workers did some unnecessary spraying, having not then learned to rely more fully on the stickleback.

This district at Bay Point, while it covers quite a large tract of marsh ground, is but a small part of the marsh district. This extends to Antioch on one side and nearly to Martinez on the other. The work could be better and more economically done if the whole south side of Suisun Bay would unite in the work of control. But the success obtained at Bay Point shows what can be done by a small enterprising community even though surrounded by an apparently hopeless expanse of mosquito-breeding marsh.

At the last session of the legislature a law was passed under which districts can be formed in any part of the State by petition of a certain per cent of the citizens. This was designed to facilitate the extermination of mosquitoes, flies, and other insects. The law also provides for the government and operation of the districts and for levy and collection of taxes for the purpose. Under this law, no doubt, many mosquito-control districts will be formed in the State, and great good should result, especially in stamping out malaria, which is caused by the *Anopheles* mosquito. It is estimated that mosquitoes cost the State annually not less than \$2,000,000, and that this sum can be saved by a yearly outlay of \$300,000.

The malaria mosquito is not a serious problem in the bay and coast regions for very few are found there, but in the interior valleys and even well into the mountains they are a serious menace to the health of the people. One thing that adds greatly to the difficulty of exterminating the *Anopheles*, or malaria mosquito, is the presence of rice fields in some of our worst malaria sections. These rice fields are kept flooded during the breeding period of the mosquito and oil can not be used for their extermination. Apparently the only alternative is to use fish for the purpose. This will be quite a problem, for the stickleback will probably not thrive in these regions as it does in the marshy country of the bays, also it may not be able to control the *Anopheles*, for they remain almost constantly at the surface of the water, and sticklebacks are not what are called surface feeders. Top minnows would be much better for this purpose, and it is probable they may be introduced into the ditches supplying water to the rice fields. Large numbers of the fish will unavoidably be lost when the fields are drained for harvesting the rice, but breeding ponds can be constructed along the ditches where the supply of fish can be kept up. Not only will these mosquito-control campaigns be helpful to residents of the section where the mosquito is a pest, but they will help to make attractive some of the best fishing grounds in the State. The angler will profit directly from work of this kind.—N. B. SCOFIELD.

FISH DIE IN MANY PARTS OF THE STATE.

During the month of August reports came in to the Fish and Game Commission of fish dying in different parts of the State from Santa Barbara to Shasta counties. The cause of death was traceable in nearly every case to the exhaustion of the free oxygen in the water by the decomposition of organic matter. In other words the fish smothered.

Fish breathe by means of gills which are so constructed that the free oxygen

which are catchment basins where organic matter is carried and deposited on the bottom. In streams of more rapid flow oxygen is supplied from the air by the movement of the water. There have been more than the usual number of cases of fish dying this summer, for the reason that there was an unusually large amount of organic matter washed into the streams during the past winter. Decomposition was held in check during the cool weather of early summer, but beginning late in July and continuing through August the



Fig. 53. Receiving trout from the fish car to plant in the American River.
Photo by the McCurry Company.

mixed in the water is extracted and passes into the blood of the animal, just as the free oxygen in the air passes into the blood of animals breathing by means of lungs. The water of streams and lakes contains more oxygen in winter than at any other time, but as spring and summer come on, the temperature of the water rises, and the fermentation and decomposition of vegetable and animal matter on the bottom or in solution increases at a rapid rate and exhausts the free oxygen in the water. This exhaustion of oxygen is most marked in lakes, reservoirs, and sluggish streams

weather was exceptionally warm. This warm weather coming at a time when the streams were low quickly exhausted the oxygen in the more quiet waters. This destruction of fish can in a great measure be prevented by ceasing to make of our streams the dumping places for garbage, factory refuse and city sewage.

AN EFFORT TO REHABILITATE THE AMERICAN RIVER.

In an effort to bring the American River and tributaries back to their former conditions when these streams furnished some of the best fishing in the State, both

salmon and steelhead, the Fish and Game Commission on July 13th planted sixty cans containing 300,000 steelhead fry.

The California fish distributing car arrived at Folsom at 5 p. m. from Sisson. The distribution was made under the personal supervision of President F. M. Newbert, who is deeply interested in bringing this stream back to its former condition. A dozen large motor trucks and many automobiles kindly loaned by the Natomas Consolidated and business men of Folsom started on the long trip to Salmon Falls. The first stop was made at Mormon Island, where twenty-one cans were placed in the South Fork of the American River above the bridge and where a remarkable picture was taken at 7.45 p.m., or just before dark. The water was found to be of fair temperature and very clear. The procession of trucks then proceeded up the river to Salmon Falls about eighteen miles, arriving there at 10.30. A committee had been sent ahead to build large bonfires. With the assistance of nearly thirty volunteers the balance of thirty-nine cans of young fry were placed in the river, where the conditions were more favorable than lower down stream.

On the return of the party to Folsom

many stories were told by the old timers of the historic mining town of the trout fishing in 1849 to 1860. Mr. John Rider, a pioneer resident of Sacramento, who came to California in 1852, informed the writer that when the teams comprising his party crossed the river at the falls of the American at what is now Sixteenth Street in Sacramento, the salmon and trout were so numerous as to frighten the horses to such an extent that two of them ran away. Soon after this period hydraulic mining came, which filled the river with debris and drove all young fish life from the stream. Since hydraulic mining has been stopped by law this stream has resumed some of its old form. After the winter freshets the water becomes quite clear, so that striped bass and many other fish are frequently taken with hook and line quite a distance up stream. Some three years ago five thousand steelhead fry were placed in the stream above Folsom as an experiment. This year a number of these fish have been taken at the mouth of the American River and some miles up stream. Hence the endeavor to rehabilitate it and bring it back to its early condition, which indeed looks promising.—GEO. NEALE.

CONSERVATION IN OTHER STATES.

A NEW DEER LAW FOR LOUISIANA.

After a consultation with the leading sportsmen and conservationists of the state President M. L. Alexander, of the Conservation Commission of Louisiana, has announced the new regulations just passed by that board in respect to the killing of deer.

The open season is set from September 15th to January 5th of each year. Does are protected until October 15th. Still hunting for bucks only, and without the use of dogs, is allowed between the 15th of September and the 15th of October. Bucks and does are allowed to be taken and killed and hunted with dogs from the 15th of October until the 5th of January. The new law provides that no deer shall be killed for sale, offered for sale, or had in possession for sale at any time. It allows one person to take five such wild deer in an open season and to possess but two carcasses or parts thereof at one time.

The new regulations do not affect the previous laws that prohibit the killing of wild deer between the hours of sunset and sunrise; or when in the water; or when driven to high land by overflow or high water; or the use of guns that have any device for deadening the sound of the explosion, commonly known as a "silencer." The snaring or trapping of wild deer is also prohibited and fawns are not allowed to be killed at any time.

"There has been such a difference of opinion as to the season in which deer should be permitted to be killed that the question of adjusting the season so as to protect the deer has been one of the hard problems of the commission," said President Alexander.

"Our experience of last year in permitting the season to open August 15th forcibly demonstrated to the commission that no deer should be permitted to be killed at so early a date. We found in many sections of the state that the

fawns were not weaned or able to take care of themselves until as late as October; that the does were poor, and the weather so hot that to permit them to be hunted with dogs simply brought about a useless destruction of this species we are so anxious to protect.

"The commission believes that no deer should be permitted to be hunted in the state before the first of October, but, in a desire to meet the wishes of certain sportsmen in the state, we decided to permit still hunting from September 15th to October 15th, and general hunting with dogs from October 15th to January 5th. The first five days in January were declared open so as to permit sportsmen to engage in a New Year's Day hunt.

"To succeed in bringing about an increase of the deer of Louisiana in any appreciable way, the Conservation Commission realizes that it will be necessary to put such restriction on their hunting so as to make it hard, rather than easy, to hunt them."

SUMMER COURSES IN BIRD STUDY.

The National Association of Audubon Societies promoted a number of courses in bird study in the different university summer schools the past summer. Special courses under the auspices of the association were given in New York, Vermont, Virginia, Georgia, South Carolina, Florida, Montana, and California. At the University of California Summer School Dr. C. Hart Merriam, formerly Chief of the United States Biological Survey, gave four illustrated lectures on wild birds and animals of North America.

GAME CONSERVATION IN OKLAHOMA.

"What a wonderful change for the worse has occurred since my trip through here—Oklahoma—thirty-eight years ago. Everywhere is total ignorance of animal life. I have not met a single sportsman or farmer who knows a mockingbird from a wren. The hunters here shoot at all seasons and kill everything with feathers or fur. Yesterday I saw a man shooting cardinals and feeding them to his dogs. All the farmers boast of killing all kinds of birds, including quail, at all seasons. In the early days, this country was filled with strong-minded, great-hearted sports-

men of the true cult. Now it seems to have only ignorant butchers. I'll say no more." — H. R. WALMSLEY. (From *Recreation Magazine* for August, 1915, page 94.)

OREGON FISH AND GAME COMMISSION REORGANIZED.

At the last session of the Oregon Legislature in the spring of this year the law relating to the Fish and Game Commission in Oregon was changed so that the Commission consists of the Governor as chairman, and four others appointed by the Governor. Two of these are appointed from District No. 1, that part of Oregon lying west of the Cascade Mountains, and two from District No. 2, lying east of the Cascade Mountains. The first commissioners are appointed for terms of one, two, three and four years, and thereafter the service is a four-year term.

The personnel of the present commission is Governor James Withycombe, chairman, Salem, Oregon; Mr. E. N. Fleischner and Mr. R. M. Warren, of Portland, Oregon; Mr. Marion Jack, Pendleton, Oregon; and Mr. C. E. Stone, Klamath Falls, Oregon.

Before the present Fish and Game Commission took office the work was divided as follows:

As Master Fish Warden, R. E. Clanton had charge of the issuance of commercial fishing licenses, and the superintending of the various hatcheries of the State which were used both for propagation of commercial fish and game fish.

As State Game Warden, William L. Finley had charge of the entire warden service in the State, and also the propagation and distribution of game birds, as well as attending to scientific and educational work.

In Oregon the Hatchery Fund is composed entirely of funds brought in from the issuance of commercial licenses, as well as any funds appropriated by the Legislature. The law provides that this fund must be kept entirely separate and apart from the Game Protection Fund, which is derived from the issuance of hunter's and angler's licenses.

Under the new organization the fish and game protection work is divided as follows:

Mr. Carl D. Shoemaker has been appointed to the position of State Game Warden. He has entire charge of the warden service.

Mr. H. L. Kelly holds the position of Master Fish Warden and has charge of the collection of commercial fish licenses, as well as matters relating to fish ladders and the enforcement of laws relating to commercial fishing.

Mr. R. E. Clanton as Superintendent of Hatcheries has charge of all the work relating to the propagation of both commercial and game fish.

Mr. William L. Finley as State Biologist has supervision of the work at the State Game Farm and is in charge of educational and scientific work in conjunction with fish and game protection and propagation.

VERMONT PASSES A FISHING LICENSE LAW.

Vermont has fallen in line and has passed a fishing license law. Doubtless many other states during the next year will do so. The fact that it is not necessary for the man who hunts to pay for the restocking of the streams. Fair play demands that the hunter pay for the preservation of game and the administration of game laws and the fisherman for the preservation of fish and the administration of fish laws.

LOUISIANA TAKES PROTECTION FROM TURKEY BUZZARD.

The constant complaint of farmers that turkey buzzards carry such diseases as hog cholera and anthrax, and the decision of the Conservation Commission that the bird is unprotected by law has led to a campaign to destroy these birds in Louisiana. Similar agitation is to be noted in other states. Some experimentation to determine the extent to which the buzzard aids in disseminating diseases of cattle and hogs has been carried on, but the evidence which should be forthcoming

before the bird is branded as a pest is not at hand. The main thing that seems to be proved is that anthrax can not be found in the feces, evidence which distinctly favors the bird's protection rather than its destruction. It is to be hoped that some investigator will fully demonstrate what part the turkey buzzard really takes in carrying disease so that each state may be able to formulate its laws accordingly. Until absolute evidence is at hand the buzzard should be given the benefit of the doubt and accorded protection.

WISCONSIN PROTECTS DOES.

The Wisconsin Legislature acted upon the recommendations of State Game Warden Sholtz and good sportsmen throughout the state, and passed a "buck law." The new law prohibits the killing of any doe deer or any fawn of either sex, and imposes heavy penalties for the shipment or possession of the carcass of any doe or fawn at any time.

It was high time. The game wardens estimated that 65 per cent of the deer killed in Wisconsin last fall during the open season were does. Besides being a much needed conservation measure, the new law will go a long way toward reducing the danger of hunters being shot by mistake for deer, as it now will be necessary to look for the horns.—*Recreation*, August, 1915.

THE AUTOMOBILE AND GAME.

Michigan is one of the first states to restrict the hunting of game by automobile. The game laws as amended by the last legislature prohibit the use of automobiles in hunting partridges. Although doe deer are still allowed to be killed, the limit has been reduced to one deer per person. The season on fox, black and gray squirrels has been closed for a term of years, as has also the season on wood duck.

LIFE HISTORY NOTES.

THRIVING BEAVER COLONIES NEAR
MENDOTA, FRESNO COUNTY,
CALIFORNIA.

The total protection given the golden beaver (*Castor subauratus*) in 1911 seems to have allowed these animals to increase greatly. Near Mendota, Fresno County, there are now at least a dozen colonies. The largest colony is to be found on Belle Island just above the large dam constructed by the Miller & Lux Company. Here is to be found a beaver house 16 feet long, 10 feet wide, and 6 feet high. This is inhabited by between

close season was instituted. At the present time there are certainly over fifty individuals within a radius of five miles, and the mammals seem to be increasing rapidly.

Reports from eastern states show that wherever the beaver has been properly protected increase always follows. Apparently we are demonstrating the same thing here in California, and if the increase continues we can expect that this valuable fur-bearing mammal will again become important commercially.—H. C. BRYANT.



Fig. 54. Beaver house on Belle Island, near Mendota, California. A number of other beaver colonies are located in the near vicinity.

30 and 40 individuals according to a man who lived until recently within 25 feet of this house. Several smaller colonies are reported as existing on one of the Miller & Lux canals a short distance below the Mendota dam. There are also three or four colonies on the San Joaquin River some distance above the dam.

According to all reports there were not more than two or three pairs of beavers in this vicinity five years ago when a

SIERRA MOUNTAIN SHEEP ON THE
INCREASE.

Last spring, while collecting some specimens for the United States Biological Survey, I was able to make a close study of one of the large herds of Sierra mountain sheep ranging north of Independence, Inyo County. I had previously estimated the number in the vicinity of Mount Baxter to be about eighty, but during a two weeks' trip we saw at least

two hundred individual sheep, and doubtless did not see many others ranging in the near vicinity. Including the Nelson mountain sheep, which inhabits the desert ranges, there must be in the neighborhood of fifteen hundred sheep in Inyo County alone. Apparently the total protection afforded the species is allowing it to increase. Fortunately, I am able to report that there has been little poaching even by the Indians, and there is every hope that mountain sheep, at least in this district, will remain a heritage to pass on to future generations.—E. H. OBER.

HARLEQUIN DUCKS IN THE SIERRAS IN 1915.

On May 2, 1915, Mr. R. S. Kimball and myself noted six strangely marked ducks on the south fork of the Merced

River just below the Wawona Fish Hatchery in Mariposa County. On investigation I am convinced that these ducks were harlequins (*Histrionicus histrionicus*.)

Records of the appearance of this species on the rushing mountain streams of the Sierras during spring and summer is of peculiar interest since this duck has very rarely been found nesting in this State. That this duck does nest along mountain streams seems to be proved, for young were taken in Tuolumne County in 1879 or 1880 and again in 1898, but additional evidence is very desirable. The harlequin duck is not uncommon along the coast where it feeds in the surf and along the kelp beds during the winter season, but its existence on fresh water during the summer is of much rarer occurrence.—J. E. NEWSOME.



Fig. 55. Nests of the American egret and the great blue heron in oak tree near Crows Landing, Stanislaus County.

A NESTING COLONY OF AMERICAN EGRETS IN STANISLAUS COUNTY.

Reports during the last few years have established the fact that the American egret (*Herodias egretta*) has been slowly increasing since protection was given it several years ago. No definite record of a nesting colony, however, has been reported. I am glad, therefore, to be able to give some definite information regarding a nesting colony located near Crows Landing, Stanislaus County.

ber this year at from fifty to seventy-five. A much larger number he said nested in the same vicinity two years ago.

Nests were placed in the tops of large oak trees which grew along a small creek (see Fig. 55). Nests of the great blue heron, two of which still contained young, could be distinguished from those of the egret by their larger size. On the ground beneath the trees three small, downy egrets and one of larger size, which had evidently tumbled out of the nests, were



Fig. 56. Downy egrets found on ground beneath nests at Crows Landing, California.

During the last part of July Mr. J. E. Newsome notified me that he had located a nesting colony of egrets and great blue herons. The place was visited on August 3, 1915. During the three hours spent in the vicinity about a dozen egrets were seen. Six were frightened away on our arrival. It was immediately evident that we were too late to take a census of the breeding birds for the young had already flown. Mr. P. F. Crow on whose ranch the birds had nested estimated the num-

ber (see Fig. 56). Although people living in the vicinity had picked up most of the molted egrettes, yet we were able to find over fifteen. A colony of black-crowned night herons was located in some nearby oak trees, but no nests were located close to those of the egrets.

That certain people are still willing to kill white herons in order to secure the plumes was evidenced by two birds which had evidently been shot and their plumes removed.—H. C. BRYANT.

BALD EAGLES KILL FAWNS.

The accompanying photograph shows a fawn which I saw killed by two bald eagles (*Haliaeetus leucocephalus*) near Five Pines, Trinity County, California, a few years ago. The doe made a desperate fight, but the pair of eagles was too much for her. One of the eagles finally succeeded in carrying the fawn away in its talons and killing it. The fawn was photographed after it had been partly devoured by the eagles (see Fig. 57).—Geo. W. GIDDINGS.

burger and myself visited the Oliver ranch near Mount Eden in order to procure some "flopers" for the State Game Farm. About some fresh-water ponds which are, however, situated in a salt marsh, we noted at different times two fulvous tree-ducks. A later visit made to the same place on June 26th also disclosed a bird of this species about a mile away from the place where one was seen on the 22d. Whether the birds were nesting in this marsh or not we were unable to ascertain.—W. N. DIRKS.

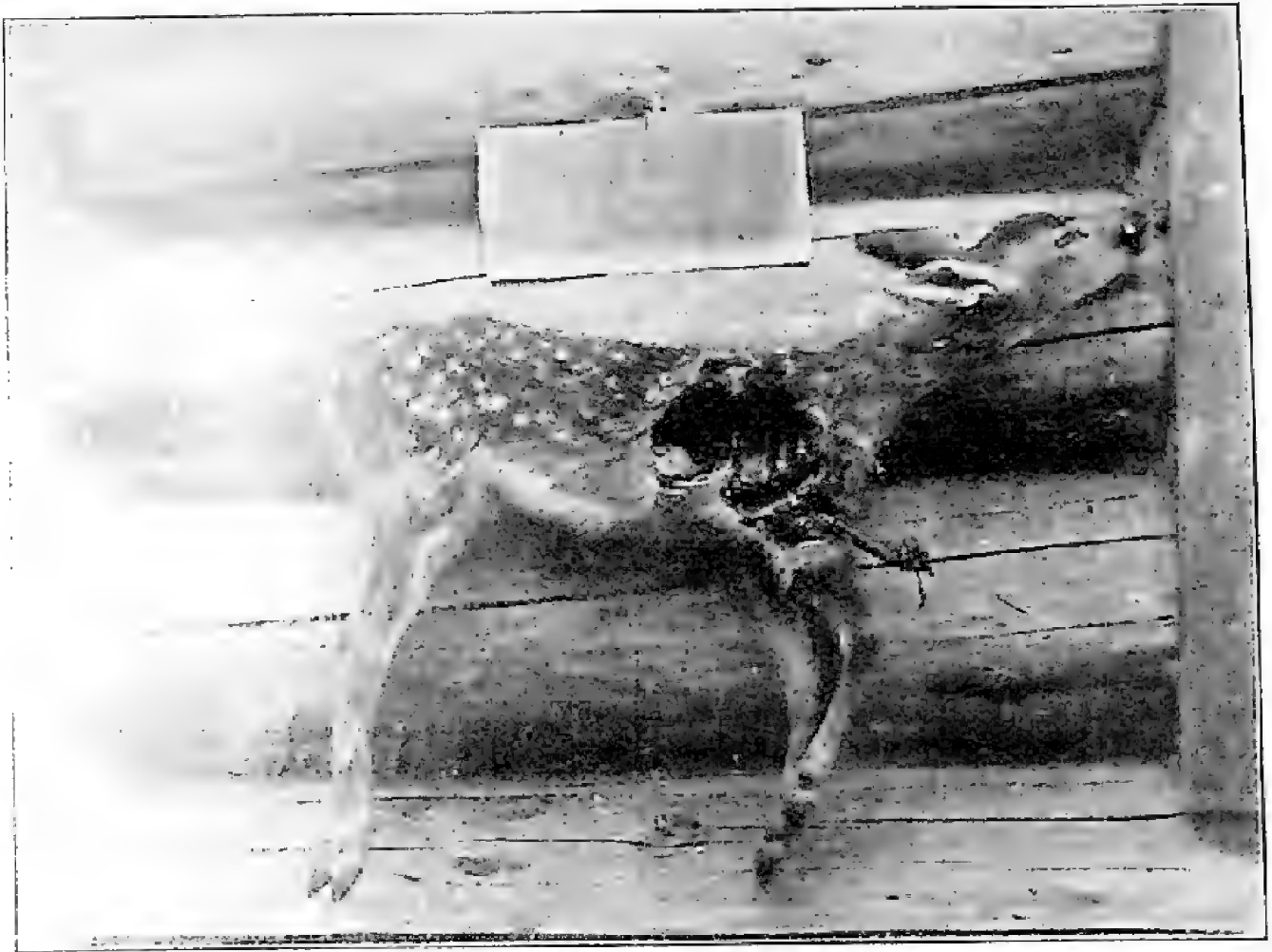


Fig. 57. Deer fawn killed by bald eagles near Five Pines, Trinity County, California. Photograph by Geo. W. Giddings.

THE FULVOUS TREE DUCK IN ALAMEDA COUNTY.

The fulvous tree duck (*Dendrocygna bicolor*), usually called "squealer," is seldom found in California except during the summer season, and even then it is largely restricted to the interior valleys where it nests. Its appearance along the coast is unusual, and hence this note of its occurrence in Alameda County seems worthy of publication.

On June 22, 1915, Mr. R. B. Gans-

HYBRID GESE.

Some very interesting hybrid geese have been reared by Mr. Chase Littlejohn of Redwood City. These hybrids are a cross between female Canada geese (*Branta canadensis*) hatched from eggs secured at Lake Tahoe and the Chinese horned goose. The horned goose gander is not of the usual type, being almost white. Four out of five of the female Canadas laid, and sixteen young have been reared. A few from the earlier

settlings were almost full grown on June 27, 1915. Although having many characteristics of the Canada goose, such as white cheeks and gray bodies, yet the two cheek patches meet on the throat and there is usually a white stripe down the middle of the neck and breast and

thing. Mr. Lee Villinger of Lodi, San Joaquin County, put 38 eggs under a buff Cochin bantam on June 12th. From this setting he hatched 33 birds. Thirteen eggs placed under another hen on July 5th furnished 10 healthy chicks. The whole 43 are alive and doing well.



Fig. 58. Hybrid geese reared by Mr. Chase Littlejohn of Redwood City, California. These geese were produced by crossing a drake Chinese horned goose with a Canada goose.

other white patches on the body. The rearing of these hybrid geese is especially interesting because of the fact that the wild Canada goose has never been successfully bred in California, and because so few characteristics of the horned goose appear in the hybrid birds.—H. C. BRYANT.

A RECORD HATCH OF VALLEY QUAIL.

It appears that the hatching of the eggs of the valley quail is not a difficult

Mr. Villinger wishes to know if anyone has been able to beat this record of 33 from one hen.—RICHARD SQUIRE.

DEER IN TRINITY COUNTY INCREASE.

Residents of Weaverville, Trinity County, estimate that deer have increased fifty per cent in their district. Junction City, Canyon Creek, Helena, Big Bar, Douglas City, and other sections also report an increase.—G. O. LAWS.

WILD LIFE IN RELATION TO AGRICULTURE.

A SPRAY FOR PREVENTING DAMAGE
BY DEER.

Early last spring I planted nine acres of pears, prunes and peaches on my range near the head of Felix Creek near Hopland, Mendocino County. My ranch containing forty acres is fenced with a hog-tight fence five feet high. The trees were planted in late March and early April, 1915. They sent out healthy shoots of eight to eighteen inches.

On visiting the ranch during the last of May, I found that deer had cropped clean all of the new shoots. On taking my troubles to the office of the Fish and Game Commission in the Mills Building, San Francisco, Mr. John P. Fisher, one of the Commission's game experts, suggested that I spray the trees with a mixture of blood-meal. I immediately procured one hundred pounds of blood-meal. This was mixed in the proportion of one pound to three gallons of water, and was painted and sprayed onto the new shoots. Depredations by deer ceased immediately.

A nearby rancher procured some of the meal and successfully protected garden truck by using it. It was found that the vegetables were not injured in the least except cabbage and lettuce which seemed to absorb some of the spray.

New growth needs to be covered about every two or three weeks in order to make the spray successful. The expense is slight. My trees have been sprayed twice and it has only cost me seventy-seven cents for the blood-meal and seven hours' work at twenty-five cents an hour. Blood-meal can be procured for \$3.50 per hundred pounds. If the value of blood-meal as a fertilizer is considered the outlay becomes still smaller. I highly recommend this method to anyone troubled by the depredations of deer or jack-rabbits. The odor of the blood-meal appears to effectively frighten the animals away.—H. C. WAGNER.

A DEER SPRAY.

As a direct result of the successful attempt to protect orchard trees from injury by deer carried on by Mr. H. C.

Wagner, the Agricultural Experiment Station at the University of California will carry on some experiments to determine whether or not blood-meal can be added to other sprays used as insecticides on apple and other orchard trees. If it is found that blood-meal can be added to the spray regularly used for codlin moth and other injurious insects, the expense attendant upon spraying to prevent damage by deer will be still further reduced. If anyone wishes to co-operate with the Agricultural Experiment Station and carry on experiments along this line, communicate with the Editor of CALIFORNIA FISH AND GAME.

OHIO TAKES A STEP BACKWARD.

Ohio has placed a bounty of one dollar on hawks. The proposed bounty law was discussed at the January meeting of the Fish and Game Protective Association of Southeastern Ohio, and at that time sufficient evidence against such a move was adduced to cause the Association to take no action in the matter. The State Game Warden, General Speaks, however, succeeded in having the bill introduced into the legislature, and it was signed by the Governor. The law is very poorly worded and will therefore give every chance of promoting the destruction of beneficial hawks. For instance, one of the hawks on which bounties are to be paid is called the "chicken hawk." Such a name has at different times been applied to almost every beneficial hawk. We are sorry to record the fact that neither the legislature nor the Governor, nor the Chief Game Warden of Ohio accepted the expert evidence furnished by the United States Biological Survey, but instead took the word of the "practical people" who had demanded the law and who did not realize wherein their best interests lay.

Perhaps this law is needed to teach the people of Ohio a lesson. We hope that in the end, when beneficial hawks are again protected, as they should be, not only will the people of Ohio be more enlightened on the subject, but a similar occurrence in other states will be impossible.

DO BUZZARDS CARRY DISEASE?

For the past few years there has been considerable agitation regarding the turkey buzzard (*Cathartes aura septentrionalis*) as a carrier of certain diseases of cattle and hogs. Recently a convention held at Ventura, California, advocated the taking of protection from this bird because of its danger to the interests of the rancher through the spread of hog cholera. Whether this bird in reality spreads this disease appears to be extremely doubtful; and certain it is that it cannot spread the disease any more than the English sparrow, blackbird, or other birds feeding in the near vicinity of infected hogs.

The following quotation from an article in *Bird Lore* (May-June, 1915, page 195)

by Mr. Robert Ridgway, one of our foremost ornithologists, bears on this point and is particularly interesting. Speaking of the causes of decrease of certain birds in Illinois, he states: "These are, the State law compelling the burial of dead animals and the shooting of large numbers of buzzards on account of the wholly erroneous supposition that they are active agents in the dissemination of hog cholera." Certainly such an ornithologist as Mr. Ridgway, connected as he is with the United States National Museum, would not make such a statement were there not ample foundation for it. Agitation in this regard is doubtless of the evanescent kind and will stop as soon as the facts are known.—H. C. BRYANT.

REPORTS.

VIOLATIONS OF THE FISH AND GAME LAWS.

June 1 to August 31, 1915.

Offense	Number arrests	Fines imposed
<i>Game.</i>		
Hunting without a license.....	44	\$610 00
Deer, close season, killing or possession.....	13	320 00
Female deer, spotted fawns, spiked bucks, killing or pos- session	12	350 00
Illegal deer hides.....	2	30 00
Illegal shipping of game, not properly marked, etc.....	1	-----
Ducks, close season, killing or possession.....	5	75 00
Night shooting	1	25 00
Quail, close season, killing or possession.....	5	150 00
Quail, trapping without proper permit.....	1	25 00
Doves, close season, killing or possession.....	5	125 00
Sage hens, close season, killing or possession.....	1	25 00
Rabbits, close season, killing or possession.....	27	480 00
Tree squirrels, close season, killing or possession.....	5	25 00
Non-game birds, killing or possession.....	5	20 00
Total game violations.....	127	\$2,260 00
<i>Fish.</i>		
Angling without a license.....	24	\$515 00
Fishing for profit without license.....	22	205 00
Dealing in fish without wholesale dealers' license.....	3	60 00
Not keeping a register of fish purchased.....	1	25 00
Underweight striped bass, taking or possession.....	7	60 00
Underweight salmon, offering for sale.....	1	20 00
Catfish, offering undersized for sale.....	1	20 00
Trout, excess bag limit; taking other than with hook and line	9	115 00
Salt-water perch, offering for sale.....	1	-----
Black bass, taken other than with hook and line.....	2	40 00
Abalones, undersized, taking or possession.....	4	40 00
Crabs, undersized, taking or possession.....	4	95 00
Lobsters, close season.....	3	50 00
Dried shrimp; Chinese shrimp nets.....	5	85 00
Clams, undersized, excess bag limit.....	2	40 00
Illegal nets and traps.....	5	150 00
Fishing in reservations.....	3	250 00
Total fish violations.....	97	\$1,770 00
Grand total fish and game violations.....	224	\$4,030 00

SEIZURES—FISH, GAME, AND ILLEGALLY USED FISHING APPARATUS.

June 1 to August 31, 1915.

Fish.

Striped bass	1,333 pounds
Salmon	132 pounds
Trout	208 pounds
Miscellaneous fish	643 pounds
Black bass	38 pounds
Clams	28
Crabs	127
Shrimp	3,169 pounds
Abalones	44
Lobsters	19
Illegal nets and traps.....	18

Game.

Deer meat	273 pounds
Hides	3
Quail	1
Doves	60
Cottontails	51

Searches.

Illegal fish and game.....	67
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NUMBER OF DEER KILLED IN VARIOUS COUNTIES DURING THE
OPEN SEASONS OF 1911-1914.

District No. 1.

County	1911	1912	1913	1914
Del Norte	No record	42	See Dist. 2	See Dist. 2
Siskiyou	275	300	313	575
Modoc	54	129	Est. 129	160
Lassen	39	50	38	89
Shasta	506	281	396	357
Trinity	707	367	522	735
Humboldt	711	256	See Dist. 2	See Dist. 2
Tehama	5	159	165	198
Totals	2,297	1,584	1,563	2,114

District No. 2.

Mendocino	422	546	345	268
Glenn	42	No record	396	90
Colusa	136	144	8	250
Lake	45	494	161	161
Sonoma	661	261	193	436
Napa	29	31	72	373
Yolo	No record	51	No record	38
Solano	23	12	14	14
Marin	355	363	325	320
Del Norte	No record	See Dist. 1	120	No record
Humboldt	See Dist. 1	See Dist. 1	700	200
Totals	1,716	1,902	2,334	2,150

District No. 3.

Plumas	28	10	23	200
Butte	2	9	No record	39
Sierra	6	No record	No record	37
Yuba	7	No record	No record	6
Sutter	No record	No record	No record	No record
Nevada	88	117	38	143
Placer	71	40	46	77
El Dorado	202	240	248	300
Sacramento	35	78	6	30
Amador	3	11	17	36
Alpine	No record	No record	See Dist. 7	39
Calaveras	47	130	204	202
Tuolumne	183	250	226	203
Mariposa	14	No record	Est. 50	53
Mono	9	7	See Dist. 7	See Dist. 7
San Joaquin	No record	See Dist. 4	30	8
Totals	695	892	888	1,373

District No. 4.

San Joaquin	No record	30	See Dist. 3	See Dist. 3
Stanislaus	No record	60	35	close season
Merced	No record	34	Est. 34	close season
Madera	43	69	Est. 69	57
Fresno	182	124	30	151
Kings	No record	No record	No record	14
Tulare	276	266	Est. 266	128
Kern	112	156	350	235
Totals	613	739	784	585

**NUMBER OF DEER KILLED IN VARIOUS COUNTIES DURING THE
OPEN SEASONS OF 1911-1914—Continued.**

District No. 5.

County	1911	1912	1913	1914
Contra Costa	4	20	Est. 20	No report
Alameda	52	270	420	8
San Francisco	No hunting	No hunting	No hunting	No hunting
San Mateo	132	155	202	5
Santa Clara	19	350	543	5
Santa Cruz	69	109	85	155
San Benito	123	67	42	11
Monterey	401	510	552	632
San Luis Obispo	25	132	Est. 132	60
Santa Barbara	See Dist. 6	See Dist. 6	210	475
Totals	828	1,613	2,266	1,351

District No. 6.

Santa Barbara	114	214	See Dist. 5	See Dist. 5
Ventura	10	125	110	No report
Los Angeles	17	186	89	143
Orange	27	38	16	21
San Diego	61	62	62	45
Imperial	No record	No record	No record	No record
Riverside	1	89	76	132
San Bernardino	22	42	40	97
Inyo	88	45	See Dist. 7	See Dist. 7
Totals	340	801	393	417

District No. 7.

Mono	See Dist. 3	See Dist. 3	Est. 7	152
Alpine	No record	No record	14	No record
Inyo	See Dist. 6	See Dist. 6	80	40
Totals			101	192

Additional Reports from National Forests.

Shasta National Forest.....				87
Lassen National Forest.....				13
California National Forest.....				238
Stanislaus National Forest.....				96
Santa Barbara Nat'l. Forest.....				89
Totals				523

Total for year 1911.....	6,489			
Total for year 1912.....		7,537		
Total for year 1913.....			8,269	
Total for year 1914.....				8,699

FINANCIAL REPORT.

Statement of Expenditures for the Months of May, June and July, 1915.

	May	June	July
General administration, salaries, traveling expenses, rentals, supplies, etc.....	\$1,435 51	\$1,557 63	\$1,467 98
San Francisco District, salaries, traveling expenses, rentals, supplies, etc.....	4,236 47	4,040 92	4,464 42
Sacramento District, salaries, traveling expenses, rentals, supplies, etc.....	3,751 72	3,813 34	4,244 14
Los Angeles District, salaries, traveling expenses, rentals, supplies, etc.....	1,382 64	1,332 81	1,756 88
Fresno District, salaries, traveling expenses, rentals, supplies, etc.....	1,667 10	1,751 25	2,012 33
Hatchery administration, salaries, traveling expenses, rentals, supplies, etc.....	476 58	504 87	457 76
Fishery research and publicity, salaries, traveling expenses, supplies, etc.....	670 66	632 36	496 49
Screen and ladder survey, salaries traveling expenses, supplies, etc.....	180 55	210 95	444 54
Fish transplanting, salaries, traveling expenses, supplies, etc.....	75 35	6 00	2 00
Fish distribution car, salaries, traveling expenses, supplies, etc.....	97 47	886 09	1,257 12
Fish patrol launches, salaries, traveling expenses, supplies, etc.....	370 81	435 68	369 49
Sisson Hatchery, salaries, traveling expenses, supplies, etc.....	2,283 88	2,681 34	2,485 09
Tahoe and Tallac hatcheries, salaries, traveling expenses, supplies, etc.....	390 69	358 21	444 42
Price Creek Hatchery, salaries, traveling expenses, supplies, etc.....	344 10	202 18	1 45
Ukiah and Snow Mountain Hatchery, salaries, traveling expenses, supplies, etc.....	395 40	433 64	399 17
Wawona Hatchery, salaries, traveling expenses, supplies, etc.....			
Sisson Hatchery, auxiliary station, salaries, traveling expenses, supplies, etc.....	411 95	345 50	141 19
Scott Creek and Brookdale Hatchery, salaries, traveling expenses, supplies, etc....	366 18	274 38	301 52
Bear Valley Hatchery, salaries, traveling expenses, supplies, etc.....	457 66	177 35	265 82
Game farm, salaries, traveling expenses, rentals, supplies, etc.....	382 25	527 97	376 99
Game research and publicity, salaries, traveling expenses, supplies, etc.....	817 79	555 66	404 63
Prosecutions and allowances.....	296 89	227 50	322 18
Hunting license commissions and refunds.....	439 10	1,962 40	300 40
Anglers' license commissions and refunds.....	20 70	1,541 60	1,442 30
Market fishing license commissions.....	217 00	40 00	35 50
Crawfish and abalone inspection.....	100 00	110 00	200 00
Mountain lion bounties.....	140 00	80 00	160 00
Printing and lithographing.....	713 86		511 23
	\$22,122 34	\$24,719 63	\$24,764 54

Balances May, June and July, 1915.

	May 1		June 1		July 1	
<i>Balance in State Treasury.</i>						
Fish and Game Preservation Fund.....	\$63,035 92		\$58,758 18		\$77,173 15	
Support and Maintenance Hatcheries Fund.....	11,284 82		17,987 91		22,613 13	
		\$74,320 74		\$71,746 09		\$99,786 28
<i>In Bank.</i>						
Fish and Game Preservation Fund.....	\$975 18		\$7,760 00		\$6,838 00	
Support and Maintenance Hatcheries Fund.....	5,070 00		2,589 00		2,700 00	
		6,015 18		10,349 00		9,538 00
Totals		\$80,365 92		\$82,095 09		\$109,324 28
Less monthly bills.....		22,122 34		24,719 63		24,764 54
Balance		\$58,243 58		\$57,375 46		\$84,559 74

INDEX TO VOLUME ONE



INDEX TO VOLUME 1.

A

Abalone, 169.
 Red, 169.
 Actinometer, 213.
 Agelenidae, 196.
Agelaius semipalmata, 191.
 Aigrette, 238.
Air sponsa, 49-52, 191.
 Albacore, 9, 11, 16, 60, 72, 172.
 Alexander, M. L., 223.
 Alien Hunter, 69.
Amara insignis, 196.
Amblyurus natalis, 62.
nebulosus, 62.
 American River, an effort to rehabilitate, 232-233.
Anas platyrhynchos, 191.
 Anchovy, 195.
 Animal, which lives without water, 135.
Anoplopoma fimbria, 118.
Anopheles, 231.
 Antelope, 1, 41, 84; present status of the pronghorned, 77.
 Antlers, 1, 6.
 Anthrax, 1, 7.
Antrocheilus phaeodactylus, 196.
 Askins, Chas., 223.
 Associated Societies for the Conservation of Wild Life, 65.
 Ardeidae, 153.
 Audubon Societies, 162, 225, 234.
 Auk, Great, 85.
 AUK, THE, 177.
 Automobile, and game, 235.
 Avocet, 181, 193.

B

Bade, Dr. Wm. F., 123.
 Badger, 96.
 Bag Limit, 68, 69, 175.
 Bailey, F. M., 175.
 Baird, S. F., 179.
 Baldpate, 187.
 Bantam, Buff Cochin, 240.
 White Cochin, 134.
 Barraenda, 60, 172.
 California, 9.
 Bass, Black, 69, 63, 148, 167, 172.
 Black Sea, 9, 60.
 Rock, 9, 60.
 Striped, 60, 63, 172.
 White Sea, 9, 11.
 Beal, F. E. L., 195.
 Beal, F. E. L., and McAtee, W. L., 176.

Bear, 45, 47, 57, 103.
 Black, 96.
 Grizzly, 96.
 Beaver, 45, 96, 100, 101, 102, 103, 222, 236; thriving colonies near Mendota, Fresno Co., 236; to be transplanted to Yosemite Valley, 222.
 Golden, 222, 236.
 Mountain, 100.
 Beetle, 136, 196.
 Bibliography; books and pamphlets relating to California birds, 175-178.
 Bighorn, 75.
 Bird, life a community asset, 20-22; economic preservation of, 75; study in public schools, 176; sanctuary, 189; a new device to protect, 131; how to attract in northeastern United States, 131; a European experiment in protecting, 131-132; books and pamphlets relating to, 175-177; summer courses in bird study, 234.
 BIRD LORE, 177, 242.
 Bird of Paradise, Lawes', 75.
 Meyer's, 75.
 Princess Stephanie's, 75.
 Prince Rudolf, 75.
 Prince Wilhelm's, 75.
 Rothschild's, 75.
 Bittern, 184.
 Blackbird, 126, 175, 242.
 Black Duck, 26.
 Blackjack, 134.
 Blind, 173, 174, 215.
 Bluebill, 133, 134.
 Bluebird, 196.
 Western, 195.
 Bobwhite, 44, 155.
 Bolton, A. L., 95.
 Bonita, 60.
 California, 9.
 Oceanic, 9.
 Bower Bird, Regent, 75.
 Brant, Black Sea, 175.
Branta canadensis, 132, 239.
 Bryant, H. C., 23, 68, 162, 176, 180, 186; ducks nest in grain fields, 28; ring-necked pheasants in Alameda County, 28; stilts prove to be wise birds, 29; predacious animals destroy ducks' nests, 29; deer and apple trees, 30; ducks die on Tulare Lake, 76; two records of the nesting of the Wilson snipe in California, 76; present

- status of the prong-horned antelope, 77; queer specimens of deer from the Whitney region, 77; Pennsylvania pays tribute to frogs, toads, and salamanders, 76; California's fur-bearing mammals, 98-107; strange hybrids, 134; sea otters near Point Sur, 134; an animal which lives without water, 135; the Sisson fish hatchery, 156-161; recent game legislation, 173-175; books and pamphlets relating to California birds, 175-177; cinnamon teal and spoonbill nesting on April 15, 191; mallards nest at game farm, 191-192; California clapper rail breeds in Alameda salt marshes, 192; at the end of the migration season, 192-194; nesting of the sora and Virginia rail in Alameda County, 194; robins and bluebirds proved friends of the farmer, 195; the roadrunner omnivorous, 195-196; thriving beaver colonies near Mendota, Fresno County, California, 236; hybrid geese, 239; a nesting colony of American egrets in Stanislaus County, 238; do buzzards carry disease?, 242.
- Buck, Spiked, 69, 174, 223.
- Buffalo, 85.
- "Bull hunting," 173, 174.
- Buzzard, Turkey, 66, 235, 242; protection taken from in Louisiana, 235; do buzzards carry disease?, 242.
- C**
- California Academy of Sciences, 93, 227.
- California Associated Societies for the Conservation of Wild Life, 123.
- California Federation of Women's Clubs, 123.
- CALIFORNIA FISH AND GAME, 127, 129, 130, 186, 228, 241.
- California State Fish, Game, and Forest Protective League, 123.
- California Wild Life Defenders, 123.
- Canvasback, 68, 133, 134, 181.
- Cardinal, 234.
- Caribou, 28.
- Castor subauratus*, 222, 236.
- Cat, Civet, 102, 107.
- House, 126.
- Ring-tailed, 96.
- Catfish, 43, 44, 169; in California, 62-64.
- Cathartes aura septentrionalis*, 242.
- Catowl, 53, 54, 55, 56, 57.
- Caulolatilus* sp., 9.
- Centrocercus pilosus*, 196.
- Cervis canadensis canadensis*, 227.
- Chamois, 42.
- Chandler, W. L., 230.
- Charr, 60.
- Chase, H., 65; review of his "game protection and propagation in America," 25; an object lesson in game conservation, 44-49.
- Chatterer, 75.
- Church, S. C., Canada geese numerous in Sacramento Valley, 132.
- Clam, Hard-shell, 169.
- Little Neck, 169.
- Pismo, 169.
- Clanton, R. E., 234.
- Clarke, F. C., 76.
- Clear Lake Bird Reservation, 185.
- Close Season, 168.
- Cobb, J. N., 70.
- Cockle, 169.
- Cod, Black, 118.
- Ling, 118.
- Rock, 171.
- Cooper Ornithological Club, 123.
- Corbina, 60.
- Cormorant, Farallon, 63.
- CONDOR, THE, 177.
- Conservation, 67, 161; efforts to conserve the game and control the violator, 3; our responsibility for the preservation of the fish and game, 4-5; fish and game conservation dependent on conservation of other natural resources, 6-8; an object lesson in game conservation, 44-49; of wild life, 173; of game, 189; in Oklahoma, 234.
- Conservationists, two kinds of, 161-163.
- Coyote, 53, 54, 55, 56, 57, 58, 96.
- Crab, 169.
- Craig, H., 42.
- Crappie, 167.
- Cricket, Jerusalem, 196.
- Croaker, White, 9.
- Spotfin, 9, 60, 172.
- Yellowfin, 60, 172.
- Cross, Manuel L., game warden, 147-148.
- Crustacean, 169, 171, 172.
- Curlew, Hudsonian, 193.
- Cutworm, 195.
- Cynosciurus nobilis*, 9.
- D**
- Dafila acuta*, 21, 191.
- Danziger, J. M., 94.
- Dendrocygna bicolor*, 193, 239.

Deer, 4, 26, 28, 45, 53, 54, 69, 86, 174, 227, 233, 234, 239; killed in New Brunswick, 27; and apple trees, 30; queer specimens from the Whitney region, 77-78; season too early, 78; breeding for horns, 125; killed in 1915, 222-223, 245-246; a new law for Louisiana, 233-234; Wisconsin protects does, 235; increase in Trinity County, 240; damage by, 241.
 Black-tailed, 42.
 Ceylon, 42.
 Fallow, 42.
 Red, 41.
 Virginia, 46.
 White-tailed, 46.
 Deputy, 211.
Didelphis virginiana, 114.
Dipodomys merriami, subsp., 135.
 Dirks, W. N., 28, 134; the fulvous tree-duck in Alameda County, 239.
 Disease, of ducks, 71; attacks mountain sheep and goats, 75; of quail, 126; of waterfowl, 225; of cattle and hogs, 235, 242.
 Districting Bill, 175.
 Doe, 47, 235.
 Dog, 57, 58.
 Dohney, E. L., 94.
 Dove, 174.
 Carolina, 153.
 Western Mourning, 153.
 Dowitcher, Long-billed, 193.
 Duck, 67, 68, 133, 134, 153, 173, 175, 184, 185, 193, 225, 228, 229; nest in orch fields, 28; nests destroyed by predatory animals, 29; market in San Francisco and Oakland, 68; die on Tulare Lake, 76; clubs, 121, 122; why decreasing, 133-134; eat oysters in Washington, 136; breeding grounds, 178; early nesting dates, 186; migrant from Great Basin, 191.
 Baldpate, 228.
 Black, 26.
 Bluebill, 133, 134, 136.
 Canvasback, 68, 133, 134, 184.
 Fulvous Tree, 193, 228, 239.
 Gadwall, 68, 228.
 Harlequin, 237.
 Mallard, 26, 28, 66, 68, 191, 228.
 Mandarin, 228.
 Pintail, 21, 68, 191, 228.
 Redhead, 68, 192, 228.
 Ruddy, 228.
 Seaup, 68.
 Greater, 136.
 Lesser, 228.

Spoonbill, 68, 75, 133, 184, 191, 228.
 Sprig, 28.
 Teal, 68.
 Bikal, 228.
 Cinnamon, 28, 184, 191, 193, 228.
 Green-winged, 184, 228.
 Widgeon, 68, 133.
 Wood, 26, 191, 235; in California, 49-52.
 Duckling, 67.

E

Eagle, 56, 57, 58.
 Bald, 66, 239; kill fawns, 239.
 East Park Bird Reservation, 185.
 Echinoderm, 136.
 EDITORIALS.

Our program, 23-24; the federal migratory bird law, 24; commendation, 24; game protection and propagation in America, 25; a plan for using the revenue from licenses, 25; live game prices, 26; our vanishing wild life, 26; a department of commercial fisheries, 26-27; a good start, 65; the non-sale of game, 65-66; game resources vividly portrayed by moving pictures, 66-67; last passenger pigeon dies, 67; how the migratory bird law works, 67-68; market ducks in San Francisco and Oakland, 68; 26,000 miles of running streams in California, 68; newspaper publicity, 68; recommend changes in game laws, 68-69; "the good old days," 69; the alien hunter, 69; a correction, 69; "conservation through education," 123; organizations defending wild life, 123; is bird protection wholly sentimental?, 124; city parks as game refuges, 124; breeding deer for their horns, 125; pheasant farming, 125; a guide book for scientific travelers on the Pacific coast, 125; the protection of non-game birds, 126; an outbreak of quail disease, 126; is the house cat a destroyer of birds?, 126; prices drop on raw furs, 126; keep your file of *California Fish and Game*, 127; what the Bureau of Education, Publicity and Research has been doing, 178; new legislation, 179; what is the future of game in California?, 179; need for accurate information, 179-180; lectures on game conservation given forestry students, 180-181; nature study in the public

- schools, 181-182; the national forests and wild life, 183-184; crude oil—a trap for birds, 184; more game refuges for California, 184-186; early nesting dates of ducks, 186; fur market improves, 186; fish expert to ed't "Hatchery and Fishery Notes," 186; the practical jokester again, 186; correspondence relative to *California Fish and Game*, 186; beavers to be transplanted to Yosemite Valley, 222; over 12,000 deer killed in California last year, 222; same fishing laws apply in national parks, 223; the army of hunters, 223; migratory bird law, 224; good photographs, 224; mortality among water fowl around Great Salt Lake, Utah, 225; the propagation of game birds, 225; Salisbury's Wild Life Pictures, 226; the Macomber pheasantry, 226; a protest against the introduction of Wyoming elk in San Luis Obispo County, 227; to game breeders in California, 228; notes from the game farm, 228; native birds furnished food, 229; how to skin a bird for mounting, 229; California deputy takes new position, 230.
- Eggs, Black-necked Stilt, 29.
 California Clapper Rail, 192.
 Cinnamon Teal, 28, 191, 228.
 Duck, 29, 228.
 Fish, 128, 157, 158, 187, 188.
 Mallard, 28, 191, 228.
 Ring-necked Pheasant, 28 132, 226.
 Spoonbill, 191.
 Sprig, 28.
 Sora Rail, 194.
 Valley Quail, 240.
 Virginia Rail, 194.
 Wilson Snipe, 76-77.
 Wood Duck, 191.
- Egret, 153, 184, 238; nesting colony in Stanislaus County, 238.
 American, 238.
 Cattle, 75.
- Elateridae, 196.
- Eleodes acuticauda*, 196.
- Elk, 41, 227; an attempt to save California, 85-96; a protest against the introduction of Wyoming elk in San Luis Obispo County, 227.
 American, 42.
 Valley, 85-96.
 Wyoming, 227.
- Ellis, S. L. N., 77, 191.
 Evans, S. C., 94.
Eugraulis mordax, 195.
Ereunetes mauri, 193.
 Ermine, 45.
Erodium sp., 196.
 Evermann, B. W., 70, 117; an attempt to save California elk, 85-96.
- F**
- Farallon Bird Reservation 185.
 Fawn, 47, 235, 239.
 Federal Migratory Bird Law, 24, 29, 67-68, 173, 192, 224, 230.
 Ferguson, A. D., 77.
 Filaree, 196.
 Finley, W. L., 65, 74, 105, 231, 235.
- FINS, FEATHERS AND FUR, 190.**
- Fish, 5, 9, 18, 96, 102, 135, 136, 158, 159, 166; ladder, 70; distribution, 69-70; live two months in ice, 72; food, 116, 120, 172; fry, 69, 130, 158, 220; identifying by scales, 129-130; and the mosquito problem, 230-231; die in many pairs of mate, 232.
- Albacore, 9, 11, 16, 63, 72, 171.
 Anchovy, 195.
 Black Bass, 60, 63, 143, 167.
 Barracuda, 9, 60, 172.
 Bonita, 9, 60.
 Catfish, 44, 62-64, 169.
 Charr, 60.
 Cod, Black, 118.
 Ling, 118.
 Rock, 118.
 Corbina, 60.
 Croaker, White, 9.
 Spotfin, 60, 172.
 Yellowfin, 60, 172.
 Crappie, 167.
 Flounder, 171.
 Hag-fish, 171.
 Halibut, 9, 116-119, 172.
 Jewfish, 60.
 Minnow, 230.
 Perch, Sacramento, 167.
 Rock Bass, 9, 60.
 Rock-fish, Red, 118.
 Roncador, Little, 9.
 Salmon, 63, 72, 129, 166, 168, 188, 189, 224, 233.
 Chinook, 187.
 Quinnat, 70, 168, 187.
 Silver, 70, 168.
 Sand-dab, 171.
 Sardine, 16, 17.

- Sea Bass, White, 9, 11.
 Black, 9, 60.
 Shad, 172.
 Shark, 9.
 Sheepshead, 9.
 Skipjack, 9.
 Smelt, 170.
 Sole, 171.
 Stickleback, 230, 231.
 Striped Bass, 60, 63, 172.
 Sunfish, 167.
 Surf-fish, 9, 60.
 Swordfish, 9, 18.
 Trout, 42, 43, 59, 60, 69, 127, 130, 148, 158, 159, 166, 167, 233; some precautions in the planting of, 220-221.
 Black-spotted, 70, 128, 167, 187.
 Cut-throat, 167.
 Dolly Varden, 42, 168.
 Eastern Brook, 70, 128, 187.
 Golden, 170.
 Lake, 70.
 Loch Leven, 27, 70, 128, 187.
 Rainbow, 42, 128, 158, 159, 167, 187.
 Steelhead, 69, 60, 128, 129, 167, 168, 233.
 Tahoe, 42, 167.
 Tuna, 9, 10, 11, 14, 16, 72, 130.
 Longfin, 9, 11.
 Yellow-fin, 9, 172.
 White Fish, 9, 60.
 Whiting, California, 9, 60, 172.
 Yellowtail, California, 9, 11, 15.
 Fish and Game Commission, California, 3, 68, 71, 78, 129, 130, 156, 161, 169, 170, 172, 175, 180, 186, 187, 195, 230, 232.
 Minnesota, political ring cripples, 27; takes up educational work, 190.
 Oregon, 125; reorganized, 234.
 Fish Planting, 220-221, 232-233; a permanent record of, 71-72.
 Fisher, J. P., some precautions in the planting of trout, 220-221; how to skin a bird for mounting, 229-230.
 Fisheries, 126, 130; commercial, 26; attempts to protect sea fisheries of southern California, 9-19; annual products of California, 130; a school of, 189.
 Fishermen, 171, 173, 188, 235; dissatisfied with fish laws, 130-131; association at Monterey, 189.
 Fishing, public, vs. private hunting, 119-122; boats wrecked by storm, 188-189.
 Flamingo, 75.
 Flicker, 196.
 Flounder, 171.
 Food, of ducks, 29, 136; of fish, 17, 136; of geese, 29; of amphibians, 78; of sea gulls, 135; of California gull, 136; of English sparrow, 137; of roadrunner, 195-196; of bluebird, 195; of robin, 195; of cottontail rabbit, 196; of starling, 196; furnished native birds, 229.
 Forbush, E. H., 126.
 Forest, 123, 126, 180; Service, 75, 184.
 FOREST AND STREAM, 127.
 Foster, H. E., 132.
 Fox, 45, 47, 103, 104.
 Gray, 96.
 Red, 96.
 Frog, 85; Pennsylvania pays tribute to frogs, 78-79.
 Fry, Trout, 66, 129, 158, 160, 220.
 Salmon, 188.
 Steelhead, 233.
 Fulvous Tree-duck, 193, 228, 239.
 Fur, 90, 100, 103, 126; trade, 96, 100, 107; market, 103; farming, 104; raw, 126.
 Fur-bearers, 44, 96, 103, 105, 236.
- G**
- Gadwall, 68.
Gallinago delicata, 193.
 Game, 4, 5, 6, 23, 45, 76, 125, 175; and the European war, 28; in New Zealand, 41-45; refuges, 23, 131, 185; fish, 60; introduced game birds, 153; future of in California, 170; breeders in California, 228; propagation of game birds, 225.
 GAME BREEDER, THE, 26.
 Game Commissioners, National Association of, Annual meeting, 74.
 Game Farm, State, 35, 37, 84, 134, 143, 203, 228, 239.
 Game-hog, 49.
 Game Laws, see law.
 Game Warden, see warden.
 Gansburger, R. B., 239.
Geococcyx californianus, 195.
Germo maculata, 9.
 atalunga, 9.
Geryoncmis lineatus, 9.
 Giddings, G. W., bald eagles kill fawns, 239.
 Gilmore, C. L., 71.
 Goat, Mountain, 75.

Goose, 66, 184, 185, 228, 239, 240; food of, 29; not a menace to rice crops, 29-30.
 Canada, 132, 239, 240; numerous in the Sacramento Valley, 132.
 Chinese Horned, 239.
 Lesser Snow, 228.
 White-fronted, 228.
 Goethe, C. M., 182.
 Grasshopper, 196.
 Graves, H. S., 183.
Grindelia cuneifolia, 192.
 Grinnell, J., 176, 192, 195; bird life as a community asset, 20-22; the Tennessee possum in California, 114-116.
 Grinnell, J., and Bryant, H. C., the wood duck in California, 49-52.
 Grinnell, J., and Swarth, H. S., 177.
 Grouse, 28, 175.
 Ruffed, 26.
 Gull, California, 136.
 King-billed, 136.
 Sea, economic status of, 135-136; why protect?, 136.
 Gun Club, 151.
Gymnosarda pelamis, 9.

H

Hag-fish, 171.
Haliaetus leucocephalus, 239.
 Halibut, fishing on Pacific Coast, 116-119.
 California, 9, 172.
 Hall, H. C., 123.
 Hare, 45, 76.
 Harlequin Duck, in the Sierras in 1915, 237.
 Harper, Harry, 123.
 Hatchery, 70, 120, 187; activity in 1915, 127-129; for San Bernardino County, 130; output of in 1915, 187-188.
 Baird, 168, 188.
 Bear Lake, 187.
 Brookdale, 34, 202.
 Hat Creek, 156.
 Price Creek, 34, 36, 69, 70, 83, 128, 129, 201.
 Scott Creek, 128, 202.
 Sisson, 34, 36, 69, 70, 83, 128, 129, 142, 201; the Sisson fish hatchery, 156-161.
 Snow Mountain, 34, 36, 128, 142, 201.
 Tahoe, 34, 35, 70, 83, 128, 130, 142, 201.
 Ukiah, 34, 36, 70, 83, 128, 142, 201.
 Wawona, 34, 36, 70, 83, 148, 201, 237.

Hawk, 57, 58, 241; Chicken, 57, 58, 241.
Hieradus egretta, 238.
 Heron, 153; Black-crowned Night, 184, 238.
 Great Blue, 66, 184, 238.
 White, 238.
 Hill, J. H., deer season too early, 78.
Himantopus mexicanus, 193.
Histrionicus histrionicus, 237.
 Hog Cholera, 235, 242.
 Honker, 175.
 Horn, 125.
 Holder, C. F., 69, 71, 125; attempts to protect the sea fisheries of southern California, 9-19.
 Hornaday, W. T., 162; review of his "our vanishing wild life," 26.
 Hudson Bay Company, 100.
 Hunt, E. W., 128, 130.
 Hunter, J. S., 51, 236; introduced game in New Zealand, 41-44.
 Hunters, 79, 88, 91, 121, 173, 190, 235; army of, 223.
 Hybrid, Strange, 131.
 Pheasant, 131.
 Goose, 239-240.
Hippoglossus hippoglossus, 9, 116.

I

Ibis, White-faced Glossy, 193.
 Indian, A Californian—hunting legend, 52-59.
 Insect, 136, 137, 230; food, 195.

J

Jewfish, 60.
 Job, H. K., 132, 225, 226.
 Johnston, E. F., fish-catching mussels, 194.
 Jordan, D. S., 117.

K

Keeler, C., 175.
 Kelley, H. L., 235.
 Killdeer, 184, 187.
 Kingfisher, Belted, 181.
 Klamath Lake Bird Reservation, 185.
 Koppel, I. L., 111; opossums near San Jose continue to increase, 195.
 Kroeber, A. L., a California Indian hunting legend, 52-59.

L

Lacey Act, 230.
 Lark, 76.
Lutax lutris nercis, 134.

- Law, Fish, 164; new ruling in navigable waters, 72-74; market fishermen dissatisfied with, 130-131; apply in national parks, 223.
 Game, 28, 173, 209, 224, 230, 235; the equity of, 148-152; Missouri's new, 196; stringent hunting laws proposed in Massachusetts, 196.
 Fish and Game, administration of, 209-212; violation of, 31, 80, 138, 197, 243.
 Legend, a California Indian hunting, 52-59.
 Legislation, 123, 179; recent fish, 164-173, recent game, 173-174.
 Libby, G., 176.
 License, 210; a plan for using the revenue from, 25; fishing, 3, 73; a shooting license law for Texas, 28; hunting, 61; new angler's, 59-62; trapper's, 106; fishing license law passed in Vermont, 235.
 Ling Cod, 118.
 Lion, bounties, 32, 33, 198.
 Mountain, 33, 63, 90, 103, 198.
 Littlejohn, C., 239.
 Lizard, 196.
Lolipes bobatus, 193.
 Lobster, Spiny, 199; in Monterey Bay, 188.
Lophortyx californicus, 151.
 Los Banos, late salmon at, 192.
 Lynx, 96, 102, 193.
 Lyre Bird, 75.
- M
- Maconber, K., 226.
Macrorhynchus griseus scolopaceus, 193.
 Mallard, 26, 28, 66, 68; nest at game farm, 191.
 Mammals, California's fur-bearing, 96-107.
 Market Fisherman, 130, 170, 171.
 Marker Hunter, 67, 122, 155.
 Marten, 45, 102, 103.
 Martin, Purple, 196.
 McAtee, W. L., 131, 136.
 McGregor, R. C., 176.
 McIlhenney, E. A., 121.
 Meadowlark, 126, 175.
 Western, 181, 195.
Melanoplus sp., 196.
Menticirrhus undulatus, 9.
 Merriam, C. H., 234.
Microschalia inaequalis, 196.
 Migration, 191; at the end of the — season, 192-194.
- Migratory Bird Law, see federal migratory bird law.
 Miller and Lux, 92, 93, 94, 236.
 Mink, 45, 64, 96, 102.
 Minnow, Top, 230.
 Mole, 45.
 Mollusk, 169, 171, 172.
 Moose, 28, 42, 45.
 Mosquito, 230, 231.
 Mountain Goat, Caucasian, 42.
 Mountain Sheep, 75, 236, 237.
 Nelson, 237.
 Sierra, on the increase, 236-237.
 Mouse, 45.
 Moving Pictures, 226; game resources vividly portrayed by, 66; of salmon industry, 75; of wild life in Oregon, 75; Salisbury, 226.
 Mudhen, 66, 184, 191, 228.
 Museum of Vertebrate Zoology, 79, 116.
 Muskrat, 45, 46, 102.
 Mussel, 194; catch fish, 194-195.
 Myers, Mrs. H. W., 123, 162.
- N
- National Association of Game Commissioners, 74.
 Nature Study, in the public schools, 181; meaning of, 216-219.
 Neale, Geo., 134, 191; wild geese not a menace to rice crops, 29; the catfish in California, 62; wild ducks are decreasing, 133-134; California valley quail and introduced game birds, 153; a record of the nesting of the wood duck in California, 191; an effort to rehabilitate the American River, 222-223.
 Net, 172.
 Chinese, 170.
 Crab, 171.
 Dip, 172.
 Fyke, 63, 171.
 Gill, 171.
 Paranzella, 170, 171.
 Trammel, 171.
 Trawl, 170, 171.
 Newbert, F. M., 72, 233; efforts to conserve the game and control the violator, 3; public fishing vs. private hunting, 119-122.
 Newsome, J. E., 238; harlequin ducks in the Sierras in 1915, 237.
 New Zealand, introduced game in, 41-44.
 Nidever, H. B., 27.

- Non-sale of Game, 8, 65, 66, 150, 178; some notes on, 2-3; a brief history of, 1-2; Maryland will try for non-sale law, 28.
- Non-game birds, 126; directions for preparing and shipping, 79.
- Numenius hudsonicus*, 193.
- O
- Ober, E. H., Sierra mountain sheep on the increase, 236-237.
- Ohio, takes a step backward, 241.
- Old, H. C., 135.
- Olor columbianus*, 132, 193.
- Opossum, 102; near San Jose continue to increase, 195.
- Ornithology, applied, 132.
- Otter, 45, 102, 103.
River, 96.
Sea, 96, 97; near Point Sur, 131-135.
- Out-of-doors, a poem, 122.
- Owl, 57, 58.
- Oyer, P. H., 188.
- Oyster, 136, 139.
- P
- Pacific Fisheries Society, 70-71, 189.
- PACIFIC FISHERMAN, 72.
- Palmer, T. S., wardens and warden work, 108-114.
- Panther, 47, 57, 58.
- Paralabrax* sp., 9.
- Pardee, G. C., fish and game conservation dependent on conservation of other natural resources, 6-8.
- Partridge, 76, 235.
English, 26.
Gray, 26.
Hungarian, 26, 27, 155, 227; in Ohio, 27.
- Payne, H. T., 175.
- Pelican, White, 66, 225.
- Perch, Sacramento, 167.
- Pterodipus ingens*, 135.
- Phalarope, Northern, 193.
- Phasianus torquatus*, 132.
- Pheasant, 66, 76, 131.
Chinese, 125.
Impeyan, 75.
Monal, 75.
Mongolian, 26.
Prince of Wales, 26.
Ring-necked, 26, 132, 134, 155, 226, 227, 228; in Alameda County, 28; breeds near San Bernardino, 132.
- Pheasant Farming, 125.
- Pheasantry, the Macomber, 226-227.
- Photographs, 224; for illustration, 212-215.
- Pigeon, 153.
Band-tailed, 67, 153.
Passenger, 67, 85.
- Pintail, 21, 68, 191.
- Plegadis guarana*, 193.
- Plover, Black-breasted, 173.
Golden, 173.
Semipalmated, 194.
Snowy, The, a poem, 221.
- Porcupine, 45, 66; in the foothills of the Sierras, 78.
- Porzana carolina*, 194.
- Possum, the Tennessee—has arrived in California, 114-116.
- Preserve, 131.
- Propagation, of fish, 59, 120, 161; of game, 161, 225-226, 228; of game birds, 225.
- Q
- Quail, 26, 66, 67, 69, 76, 126, 131, 227.
Bobwhite, 44, 155.
California Valley, 68, 154, 155, 228; and introduced game birds, 153-155; a record hatch of, 219.
Desert, 174.
Mountain, 44, 175.
Valley, 174, 229.
- Querquedula cyanoptera*, 191, 193.
- R
- Rabbit, 45, 102, 131.
Cottontail, 174, 175; reported as a pest in San Diego County, 196.
Bush, 174, 175.
- Raccoon, 29, 45, 64, 96, 102.
- Rail, California Clapper; breeds in Alameda salt marshes, 192.
Carolina, 194.
Sora, nesting of in Alameda County, 194.
Virginia, nesting of in Alameda County, 194.
- Rallus virginianus*, 191.
- Rancho La Brea, 184.
- Rankin, E. P., the halibut fishery of the Pacific coast, 116-119.
- Rat, Kangaroo, 135.
- Redhead, 68, 133, 134, 192.
- RECREATION, 28, 131, 223, 234.
- Recurvirostra americana*, 193.
- Reports, see tables of contents.
- Refuge, 175, 184; game, 184, 185; Illinois adopts the idea, 28; wild-life, 131.
Angeles National Forest, 166, 185.

- Big Basin, 185.
 Cleveland National Forest, 166, 185.
 Lake Merritt Game, 166.
 Pinnacles National Monument, 166, 185.
 Trinity National Forest, 166, 185.
 Reservation.
 Clear Lake Bird, 185.
 East Park Bird, 185.
 Farallon Bird, 185.
 Klamath Lake Bird, 185.
Rhus integrifolia, 196.
 Ridgway, R., 242.
 Rifle Bird, 75.
 Roadrunner, omnivorous, 195-196.
 Robin, 126, 175; and bluebirds proved friends of farmer, 195.
 Western, 195.
 Rock-fish, Red, 118.
 Roncador, Little, 9.
Roncador stearnsi, 9.
 Rowley, J., 96.
 Rutherford, F. M., our responsibility for the preservation of game and fish, 4-5.
- S
- Sage, Mrs. Russell, 124.
 Sage Hen, 175.
 Salamander, 78.
Salicornia, 192, 194.
Salina hildens, 42.
 Salmon, 60, 61, 72, 129, 130, 166, 168, 188, 189, 221, 233; stored in ice, 72.
 Chinook, 187.
 Quinnat, 70, 168, 187.
 Silver, 70.
 Salisbury, E. A., 66, 226.
 San Bernardino Trout Association, 130.
 Sanctuary, 227; a new bird, in Connecticut, 189-190.
 Sand-dab, 171.
 Sandpiper, 225.
 Least, 184.
 Western, 193.
Sarda chilensis, 9.
 Sardine, 16, 17.
 Scamp, 68, 136.
 Lesser, 136.
 Schaeffle, E., some notes on the non-sale of game, 2-3; the new angler's license, 59-62; Manuel L. Cross, game warden, 147-148; the administration of fish and game laws, 209-212.
 Scofield, N. B., 24, 180, 186; identifying fish by their scales, 129-130; recent fish legislation, 164-173; the spiny lobster in Monterey Bay, 188; fish and the mosquito problem, 230-231.
 Scott, C. DeW., the meaning of nature study, 216-219; the snowy plover, a poem, 221.
 Scorpion, 196.
 Scoter, White-winged, 136.
 Screen, 158, 160; and ladder investigation, 70.
 Seal, Guadalupe Fur, 96.
 Pribilof Fur, 100.
Sebastes sp., 118.
 Seine, 63, 172.
Seriola dorsalis, 9.
Seriphus politus, 9.
 Seton, E. T., 107.
 Shad, 172.
 Shark, 9.
 Shebley, J. O., 156.
 Shebley, W. H., 156; hatchery activities in 1915, 127-129.
 Sheep, Karakul, 101.
 Mountain, see mountain sheep.
 Sheepshead, 9.
 Skipjack, 9.
 Shoemaker, C. D., 235.
 Shore birds, 175.
 Shrimp, 169, 170.
 Simpson, G. M., 125.
 Skunk, 45, 66, 96, 102.
 Slug, 137.
 Smelt, 170.
 Smith, H. M., 70, 189.
 Snake, 85.
 Snipe, 225.
 Wilson, 66, 173, 193; nesting of in California, 76-77.
 Sole, 171.
 Sparrow, English, 21, 22, 126, 196, 242; English investigator defends, 136.
Spatula clypeata, 191.
 Spawn, Trout, 66, 157, 159.
Sphyræna argentea, 9.
 Spider, 137, 196.
 Spoonbill, 68, 75, 133, 184, 191.
 Sportsmen, 190, 234; in Pennsylvania do fine work, 74-75; league in Oregon, 190.
 Spray, for preventing damage by deer, 241.
 Sprig, 28.
 Squealer, 239.

Squire, R., a record hatch of valley quail, 240.
 Squirrel, 45.
 Black, 235.
 Fox, 235.
 Gray, 96, 235.
 Starling, European, in the eastern United States, 196.
 Steelhead, 60, 66, 128, 129, 167, 168, 233.
Stenopelmatus sp., 196.
Stercolepsis gigas, 9.
 Stickleback, 230, 231.
 Stilt, Black-necked, 29, 184, 193; prove to be wise birds, 29.
 Stomach contents, 137.
 Stomach, examination, 135; for scientific purposes, 79.
 Storer, T. L., 224; directions for preparing and shipping game and non-game birds or stomachs for scientific purposes, 79; some hints on making photographs for illustration, 212-215.
 Sunfish, 167.
 Surface, H. A., 78.
 Surf-fish, 9, 60.
 Swallow, White-bellied, 196.
 Swan, Whistling, 193; in the Sacramento Valley, 182.
 Swordfish, 9, 18.

T

Taylor, W. P., 107, 123, 180; two kinds of conservationists, 161-164.
 Teal, 68.
 Cinnamon, 28, 184, 193; and spoonbill nesting on April 15, 191.
 Green-winged, 184.
Tetrapturus mitsukurii, 9.
Thunnus thynnus, 9.
 Tierce, 189.
 Toad, 78.
 Torrey, B. B., 176.
 Trap, 46.
 Fish, 160.
 Lobster, 171.
 Trapper, 100, 106.
 Trogon, Resplendent, 75.
 Trogon, 75.
 Trout, 42, 43, 59, 60, 69, 127, 130, 148, 158, 159, 166, 167, 220, 232, 233; planting of, 220-221.
 Black-spotted, 70, 128, 167, 187.
 Cut-throat, 167.
 Dolly Varden, 42, 168.

Eastern Brook, 70, 128, 187.
 Golden, 170.
 Lake, 70.
 Loch Leven, 27, 70, 128, 187.
 Rainbow, 42, 128, 158, 159, 167, 187.
 Steelhead, 60, 66, 128, 129, 167, 168, 233.
 Tahoe, 42, 167.
 Tuna, 9, 10, 11, 14, 16, 60, 72, 130; disappear, 72; industry, 130.
 Yellow-fin, 9.
 Leaping, 9, 17.
 Turkey, Wild, 26.
 Turtle, 64, 85.
 Tyler, J. G., 77, 177.

U

Uta stansburiana, 196.
 United States Biological Survey, 50, 67, 75, 104, 131, 176, 180, 196, 224, 225, 230, 234, 240.
 United States Bureau of Animal Industry, 75, 126.
 United States Bureau of Fisheries, 63, 127, 187.
 United States National Museum, 242.
 University of California, 180, 241.

V

Villinger, L., 240.
 Vogelsang, Chas. A., the equity of the game laws, 148-152.
 Von Berlepsch, Baron, 131.

W

Wagner, H. C., a spray for preventing damage by deer, 241.
 Wall, E., ring-necked pheasant breeds near San Bernardino, 132-133.
 Walmsley, H. R., 234.
 Wapiti, 42.
 War, 223; and the feathered tribe, 76.
 Warden, Game, 112, 147, 186, 210, 211; boy scouts become, 131; wardens and warden work, 108-114.
 Water-fowl, 129, 133, 153, 175; mortality among, 225.
 Weasel, 45, 96.
 White, 103.
 Wetmore, A., 76, 225.
 Westerfeld, C., 70.
 Wheelock, I. G., 176.
 Whitefish, 9, 60.
 Whiting, California, 9, 60, 172.

- Widgeon, 68, 133.
 Wild Cat, 45, 57, 58, 66, 103.
 Wildfowl, 173, 228.
 Wild Life, 123, 131, 183; our vanishing,
 26; protective league, 123; refuges,
 see refuge.
 Willett, G., 176.
 Wireworm, 136, 196.
 Wolf, 45, 47, 57, 58, 103.
 Wolverine, 96, 103.
 Woodchuck, 45.
 Woodcock, 28.
 Wood Duck, 26, 191, 235; in California,
 49-52; nesting in California, 191.
 Worm, 137.
 Wren, House, 196.
- X
- Xiphias gladius*, 9.
- Y
- Yellow-fin, 172.
 Yellowlegs, 173.
 Yellowtail, 11, 15, 60.
 California, 9.
 Yosemite, 148, 185, 222, 223.

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1915 CALIFORNIA FISH AND GAME LAWS 1917

WHITE SQUARES INDICATE OPEN SEASON DARK SQUARES INDICATE CLOSED		DIS- TRICT	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	REG. LIMITS, ETC.
DEER	1-23														No Deer, Fawns or Spiky Bucks. No Sale of Meat. Two Bucks per season.
	2-3														
	4														
RABBITS, (COTTONTAIL and BRUSH)	All														15 per day. 30 per week.
TREE SQUIRRELS	All														12 per season.
Elk, Antelope, Mountain Sheep	All														KILLING OF ELK A FELONY.
SEA OTTER	All														5,000 FINE.
Ducks, Geese, Brant, Mudhens	All														Ducks and Geese 25 per day; 50 per week. Mudhens and Black Sea Brant 11 per day; 21 per week.
WILSON SNIP, BLACK BREASTED PLOVER, YELLOW LEGS, GOLDEN PLOVER	All														15 per day. 30 per week.
Rail, Wood Duck, Wild Pigeon	All														
VALLEY and DESERT QUAIL	All														15 per day. 30 per week.
Mountain Quail or Grouse	1-23														10 Mountain Quail per day; 20 per week. 4 Grouse per day; 8 per week.
	2-3-4														
SAGE HEN	All														4 per day. 8 per week.
DOVE	All														15 per day.
TROUT															20. Take Trout in one day in this or District One, unless you fish in both districts. No limit on White Fish.
WHITE FISH	23														
TROUT OTHER THAN GOLDEN	1-4														20 Fish or 10 pounds and 1 Fish or 1 Fish weighing 10 pounds or over per day. In District 2 from Dec. 15 to Feb. 14, 2 Fish per day.
	5														
	6-9														
GOLDEN TROUT	All														20 per day, 5 inch minimum length.
BLACK BASS	1-12														25 per day, 7 inch minimum length. No Sale.
	13-5														
Sacramento Perch, Sunfish, Crappie	All														25 per day. No Sale.
SALMON	1-12														No closed season for hook, line or spear. 3 per day Sept. 25 to Nov. 14. Hook and line only in District 15.
	13														
STRIPED BASS	All														5 per day and 3 pounds day limit. Not more than 5 per day Sept. 25 to Nov. 14. No sale nor shipment under 5 lbs.
CATFISH, SHAD	All														No closed season or size limit with hook and line for sport.
CRABS	All														To be taken with hoop or crab net only. No Poison. None less than 7 inches.
SPINY LOBSTER (CRAWFISH)	All														To be taken with crawfish trap only. None less than 7 inches nor more than 12 1/2 inches in length.
ABALONES Red	All														Must measure Red, 19 inches Green, 18 inches Pink, 16 inches Black, 14 inches. In District 19 and 20, daily limit of 10, but on Black. Fee limit only. No drying. No export.
ABALONES Green, Pink, Black	All														

* All other waterfowl and shore birds are protected.
Waterfowl only may be shot in District 28.

HUNTERS' LICENSES

JULY 1st TO JUNE 30th

Obtain of County Clerks or Fish and Game
Commission or Deputies

CITIZENS, resident of California	\$1.00 per year
CITIZENS, non-resident of California	10.00 per year
ALIENS,	25.00 per year

For market fishing laws see special market fishing cards or booklets of laws in full.

All shooting forbidden in districts, 24, 25, 26, 27, 29

ANGLERS' LICENSES

JANUARY 1st TO DECEMBER 31st

Obtain of County Clerks or Fish and Game
Commission or Deputies

CITIZENS, residents of California, over 18 years	\$1.00 per year
CITIZENS, non-resident of California, over 18 years	3.00 per year
ALIENS, over 18 years	3.00 per year